World Fishing Fleets

An Analysis of Distant-water Fleet Operations

Past - Present - Future

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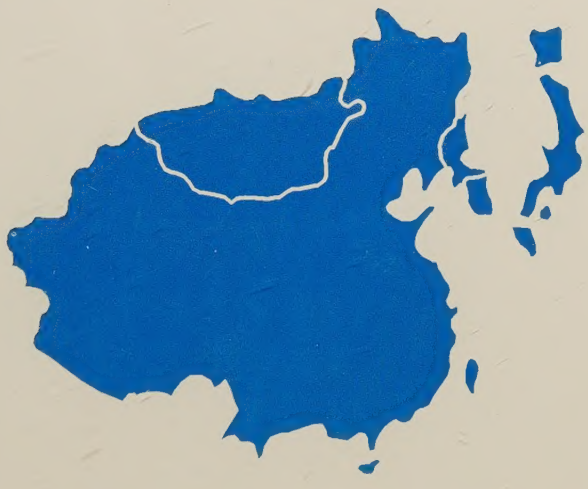

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Prepared by
The Office of International Affairs

Mark R. Wildman

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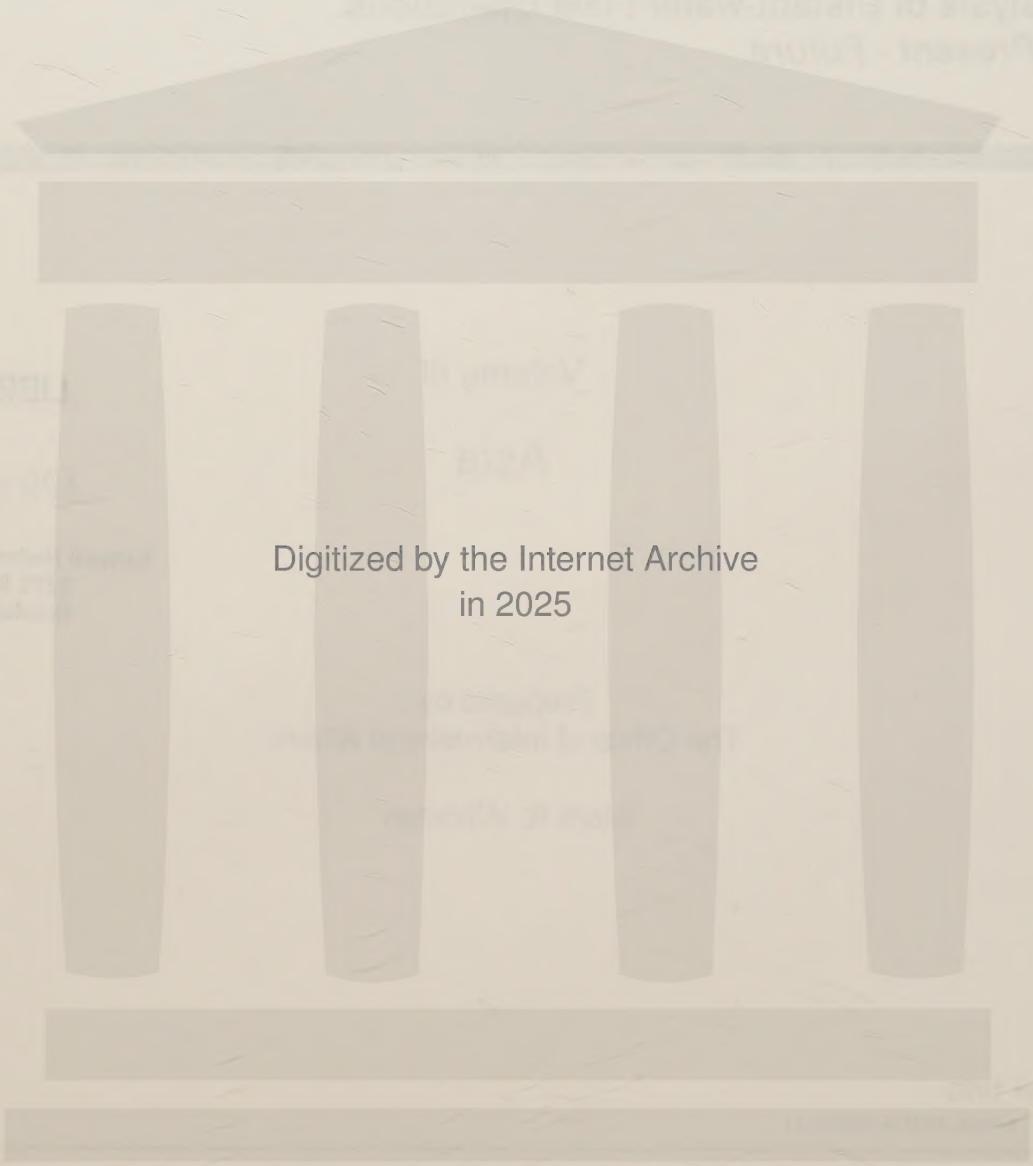
National Oceanic and Atmospheric Administration
Silver Spring, Maryland
November 1993



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Preface

The National Marine Fisheries Service (NMFS) Office of International Affairs prepared this study from April to October 1993. This volume focuses on the four Asian distant-water fishing fleets which have conducted the most extensive global fishing operations among all Asian fishing fleets. International highseas fishery issues directly related to distant-water fishing fleet operations (e.g. transboundary stocks, reflagging) are receiving increased attention in international fora, particularly in the United Nations. This study was undertaken in an effort to pinpoint current major distant-water fishing fleet effort and, with this information, try to predict future trends in the deployment of these fishing fleets.

Acknowledgements

Numerous individuals have helped prepare this volume. The overall operations were conducted under the direction and support of the NMFS Senior Scientist, Dr. Michael Sissenwine, the Office of International Affairs Director, Henry Beasley, and the Division Chief for International Science, Development, and Foreign Fisheries Analysis, Frederick Beaudry. The research design and project implementation for this volume was coordinated by Mark Wildman. The author is grateful to all the Division staff involved in the preparation of this volume: Seiko Green, Tracy Yuen, Christine Parker, and Milan Kravanja. In addition, many thanks go to Nina Loewinger and Paul Niemeier for their proofreading assistance.

The author is indebted to a much longer list of individuals and organizations for information and guidance. The author would particularly like to thank Mr. Douglas Ancona, Regional Attache for Oceans and Natural Resources, U.S. Embassy Tokyo, for providing extensive information on the Japanese distant-water fleet and helpful comments on the Japan chapter. In addition, the author would like to thank the American Institute in Taiwan, Economic Section, for its submission of detailed information regarding the Taiwan distant-water fishing fleet.

1

Overview

There are four major participants among Asian distant-water fishing fleets: China, Japan, the Republic of Korea (ROK), and Taiwan. With the exception of China, these fleets have fished the world's oceans for over 30 years. China's distant-water fleet emerged in the mid-1980s and is likely to grow for the foreseeable future. Other countries in the Asia-Pacific region possess fishing vessels capable of distant-water fishing operations, but these vessels operate primarily in their own 200-mile fishery zones.

Japan, the ROK, and Taiwan began large-scale distant-water operations during the 1960s. These fleets have created an impressive global distant-water fisheries network which has enabled them to rank among the world's largest in terms of vessel numbers, tonnage, and catch. Asian distant-water fleets focus their efforts on a small number of commercially valuable species: tuna, squid, shrimp, and groundfish (e.g. Alaska pollock).

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I. Distant-water Fishing Fleets

Fleet statistics from Lloyd's of London for large distant-water fishing vessels (greater than 500GRT) indicate that only Japan is significantly reducing its fleet (appendix A). Official data for each fleet, however, indicates that some fleet reduction is also taking place in the ROK and Taiwan (appendix B). Fleet reduction is especially prominent in the Japanese, ROK, and Taiwan trawler fleets.

Distant-water catch statistics for Japan, the ROK, Taiwan, and China also indicate that overall distant-water effort has peaked and is decreasing, probably for the foreseeable future (appendix C, figures 1 and 2). Total distant-water catch for the four fleets decreased nearly 20 percent from 1987 to 1991. The sector which has shown the most dramatic decrease is the North Pacific trawl fishery.

China is the one notable exception to this "downsizing" trend. The Chinese Government is placing great emphasis on the development of all sectors of Chinese fisheries, with particular emphasis on the distant-water sector. China's plentiful supply of cheap labor gives it an advantage over its industrialized East Asian competition. China has acquired a significant number of large factory trawlers in the past few years, and is conducting distant-water operations primarily in Africa, but is also active in South America and Oceania. All indications are that China's distant-

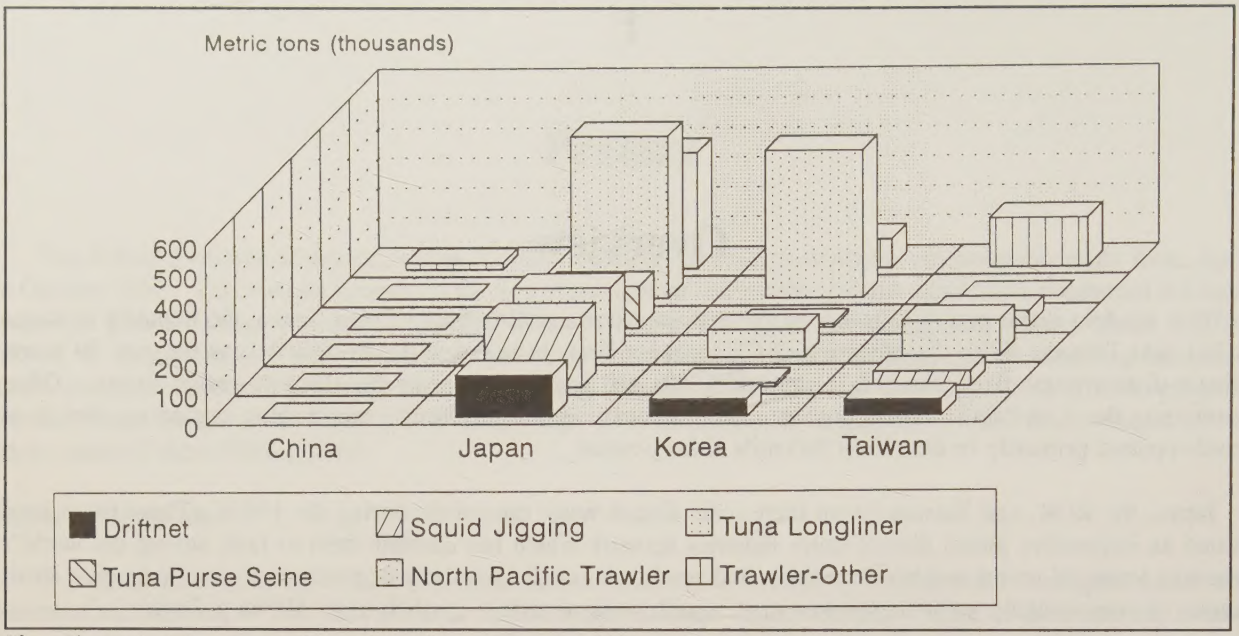

Figure 1. -- Asia. Distant-water fish catch, by fleet and quantity, 1985.

water fleet will continue to increase for the foreseeable future as China attempts to reach an overall fisheries catch goal of 20 million tons (t) by the year 2000.

Other countries in the Asia-Pacific region which possess fishing vessels capable of distant-water fishing operations include: Australia, Bangladesh, Hong Kong, India, Indonesia, Iran, the Democratic Republic of Korea (DPRK), Malaysia, the Maldives, the Federated States of Micronesia (FSM), Nauru, New Zealand, the Philippines, the Solomon Islands, Sri Lanka, Thailand, Vanuatu, and Vietnam.[1] With the exception of distant-water tuna vessels operated by Indonesia, the Philippines, and Vanuatu, however, these vessels operate primarily in the 200-mile Exclusive Economic Zone (EEZ) of their respective countries. Vessels from these three countries concentrate their distant-water fishing efforts primarily in Pacific Ocean tuna fisheries.

Although Asian distant-water fishing fleets have engaged in numerous fisheries over the past 30 years, the following four major distant-water fisheries will be analyzed: 1) the distant-water trawler fisheries, 2) the high-seas pelagic driftnet fisheries, 3) the squid jigging fisheries, and 4) the distant-water tuna fisheries.

A. Trawlers

North Pacific: The primary North Pacific distant-water trawler fishery has taken place in the high-seas area of the central Bering Sea known as the "donut hole." This fishery began during the early 1980s and has been conducted by stern factory trawlers from Japan, the ROK, China, Poland, and the former Soviet Union/Russian Federation. Japan and the ROK started fishing in the donut hole during 1981-82, and China followed in early 1985. The number of vessels fishing in the donut hole increased dramatically during the 1980s, from only a few exploratory vessels in 1981, to over 300 in 1990. The donut hole catch peaked in 1989 at 1.4 million metric tons (t), but decreased precipitously in the succeeding three years to 11,000 t in 1992 (appendix D).[2]

The dramatic decline in Alaska pollock catches in the donut hole provided the impetus for a series of multilateral negotiations in the early 1990s. In 1992, a voluntary moratorium on fishing within the donut hole during 1993-94 was declared. The closure of the donut hole has caused the distant-water North Pacific trawler fleets of East Asia to disperse to other fisheries. The large Japanese fishery companies have sold most of their factory trawlers to foreign joint venture partners or transferred the vessels to fisheries in the South Atlantic and Pacific, the so-called southern

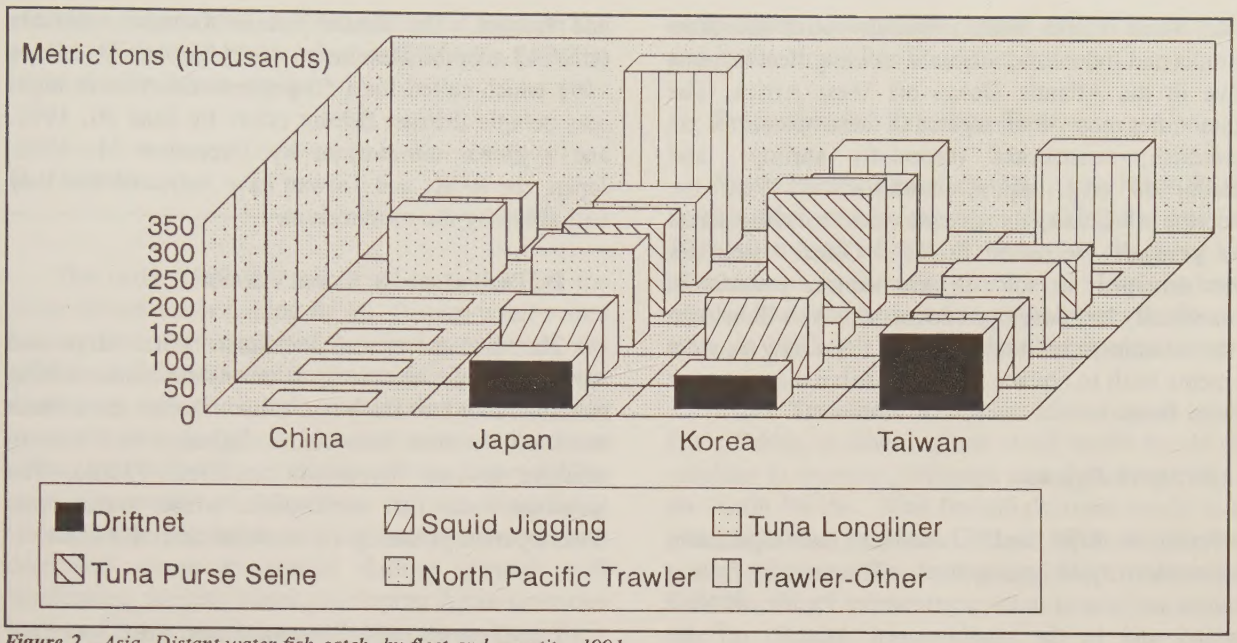

Figure 2.--Asia. Distant-water fish catch, by fleet and quantity, 1991.

trawl fisheries.[3] The Japanese Government announced a compensation plan in November 1991 which encouraged small-and medium-sized trawler companies to reduce their donut hole fleets between 1991-94 by offering $1.9-$3.2 million per vessel in compensation.[4] Since the closure of the donut hole to fishing, small to medium-sized Japanese trawlers have been restricted to domestic Alaska pollock fisheries off the coast of Hokkaido. The ROK and China, however, have transferred most of their donut hole fleets to the so-called "peanut hole," located in the international waters of the Sea of Okhotsk off the coast of Russia.

No foreign fishing took place in the peanut hole region until 1991 when donut hole catch decreased dramatically. The ROK has reportedly transferred 18-23 of its 41 vessel North Pacific trawling fleet to the region, while 4-5 Chinese vessels operate there.[5] The Russian Federation, under pressure from Far Eastern fishing interests and fearing another resource collapse *à la* the donut hole, has enacted a new law which bans all fishing in the peanut hole, effective June 15, 1993.[6] The ROK and China have protested this unilateral action affecting a fishery located in international waters and China continues fishing there.

The Russian Government convened a multi-lateral meeting in late May 1993 to discuss fishing activity in the peanut hole. At this meeting, the ROK and China pledged to reduce their 1993 catch in the peanut hole by 25 percent. Japan reaffirmed its commitment not to fish in the peanut hole, but Poland would make no commitment to reduce effort. Another meeting is scheduled to be held in Moscow during October 1993 to further discuss the future of this fishery.

The ROK North Pacific trawler fleet has also attempted to secure access to Alaska pollock resources within the Russian EEZ. The ROK did obtain Russian allocations in 1992 and 1993, but have so far managed only a negligible Alaska pollock catch in Russian waters. ROK vessels were given Alaska pollock allocations in the waters of the disputed Northern Territories in 1992, but the Japanese Government urged the ROK to respect the Japanese claim to the Territories, and thus the ROK actually caught very little Alaska pollock in Russian waters during 1992. In 1993, the ROK was given an allocation in the Russian EEZ of 150,000 t, but the inability of the two sides to reach quick agreement on the price ROK companies would have to pay for a ton of Alaska pollock has resulted in limited ROK fishing within Russian waters.

Other Distant-water Trawlers: All four of the major Asian distant-water fishing fleets have engaged in distant-water trawling. Japan and the ROK are the most active, with significant fleets in the Atlantic, Pacific, and Indian Oceans. Taiwan has had a limited

distant-water trawler fleet, primarily active in waters off India and Indonesia. China's trawling fleet is most active in the Atlantic Ocean off West Africa. The commodities most often targeted in these operations are groundfish, crustaceans (especially shrimp), and cephalopods (e.g. squid, cuttlefish). With the exception of China, the distant-water trawling fleets have gradually decreased in size. Older vessels are either scrapped, or sold to joint venture partners in economically less developed countries. As will be seen in the subsequent individual studies, few new trawlers are being built to replace the aging Asian distant-water trawler fleets.

B. Squid Jiggers

Japan, the ROK, and Taiwan, each have significant distant-water squid jigging fleets. The primary fishing grounds are located in the southeastern Pacific off New Zealand and in the southwestern Atlantic off the Falkland Islands and Argentina. With the driftnet moratorium, the distant-water squid industry will obviously become more reliant on this method. A considerable amount of exploratory jigging has been conducted in the former North Pacific squid driftnet fishery, but with little or no success.[7] In the past few years, attention has turned to new grounds off the Pacific coast of Latin America. Squid jigging off Peru, and, to a lesser extent, off Mexico, and Ecuador has become increasingly popular. One sticking point, however, is that coastal Latin American nations, especially Peru, are requesting high access fees which make profitable operations problematic.

C. Driftnet Vessels

Fishermen from Japan, the ROK, and Taiwan, engaged in high-seas pelagic driftnet fisheries from the early 1980s until the end of 1992. These fisheries operated almost year-round and utilized driftnets that often stretched from 30 to 60 kilometers in length per vessel. The extensive and indiscriminate nature of these fisheries focused heightened international concern on the conservation and protection of both target species, such as squid and tuna/billfish, and non-target species, such as marine mammals, seabirds, salmonids, and other resources.

There were two high-seas pelagic driftnet fisheries in the North Pacific: (1) a squid driftnet fishery conducted by the three above-mentioned fleets; and (2) a large-mesh tuna/billfish fishery conducted by Japan and Taiwan. The United Nations General Assembly (UNGA) adopted Resolution 46/215 in late December 1991 which called for a 50 percent reduction in high-seas pelagic driftnet fishing effort by June 30, 1992, and a global moratorium by December 31, 1992. Japan, the ROK, and Taiwan have indicated that they will abide by the moratorium.

D. Distant-water Tuna Vessels

The distant-water Asian tuna fleets, large and varied, mainly use two distant-water tuna fishing methods: longline and purse seine. Before the driftnet moratorium, there was also a Japanese and Taiwan albacore driftnet fishery in the South Pacific. The longliner fleets fish world-wide, while purse seine fleets operate primarily in the west-central Pacific.

Longliners: Asian distant-water tuna longliner fleets are concentrating on high-value bigeye, yellowfin, and bluefin tuna for the Japanese sashimi market. Most of the Taiwan, ROK, and Japanese longliners are now equipped with super low-temperature freezing equipment which enables them to maintain the high quality necessary for this lucrative market. It appears that an increasing number of distant-water tuna vessels are concentrating on Pacific Ocean grounds instead of Indian Ocean or Atlantic Ocean grounds.

This concentration on the Japanese sashimi market has resulted in an oversupply of sashimi-grade tuna. The four major sashimi tuna suppliers (Japan, the ROK, Taiwan, and Indonesia) hold periodic private-level meetings to discuss ways to rationalize distant-water tuna fleet operations and minimize oversupply problems. Japanese industry observers currently feel that China and Indonesia, given their plentiful and cheap labor, may someday replace the current "big three" Asian distant-water tuna fleets.[8]

Purse Seiners: Asian distant-water purse seining effort is concentrated in the central western Pacific. The distant-water purse seine fleets of Japan, the ROK, and Taiwan have all increased in number during the past few years. Their effort is concentrated on skipjack and yellowfin tuna resources in waters off South Pacific island nations such as Papua New Guinea and Micronesia. The South Pacific Forum Fisheries Agency, concerned about this rapid increase in effort,

enacted an agreement in 1992 placing a limit on the number of foreign purse seiners eligible for licensing in the Pacific Island region.

II. Outlook

The early 1990s is a time of transition for the Asian distant-water fishing fleets. Distant-water vessel owners from the developed economies of Japan, the ROK, and Taiwan are hiring more foreign labor from developing countries and modernizing their fishing gear, but there is little evidence to suggest that these efforts will be sufficient to make distant-water fishing a viable source of long-term revenue. Increasing international regulation of high-seas fisheries and decreased access to coastal fishing grounds will accelerate a process where developing Asian countries such as China take over catch operations from their industrialized Asian neighbors.

Other developing Asian countries may become increasingly involved in distant-water fisheries. India, Indonesia, and Iran, three countries with significant natural and human resources, are currently making plans for distant-water fleet development. Iran and Indonesia are concentrating on exploiting tuna resources, while India has been developing a trawler industry supplying its nascent surimi industry.

A. Trawlers

The distant-water trawling fleets should show the greatest decreases in effort among all Asian distant-water fleets. Access to both high-seas and coastal fishing grounds has become extremely limited as groundfish stocks which once supported these fleets (e.g. Alaska pollock, Atlantic cod) have been severely over-fished. The Japanese distant-water trawler fleet is clearly on the wane and will be significantly reduced, if not entirely eliminated, by the end of this century. The ROK and Taiwan fleets face similarly bleak prospects and may also have to significantly curtail their distant-water trawling operations. China is the only major Asian distant-water fishing nation which plans to expand its distant-water trawling in the near future. Much of this expanded effort will probably go into coastal fisheries in the eastern Atlantic off the west coast of Africa, southwestern and southeastern Atlantic fisheries off Argentina and Chile, and in the North Pacific peanut hole.

Projection for Trawling Fleet

North Pacific Trawlers: The Asian North Pacific trawler fleet should decrease significantly from the 1991 catch level of 450,000 tons. If the donut hole moratorium continues past 1994 and stringent regulation of the peanut hole takes place, the level of effort in 1995 will probably be considerably lower.

Other Trawlers: The Asian distant-water trawler fleets fishing in other regions of the world should also continue to decrease, although at a slower rate than in the North Pacific. This limited decrease would result primarily from increased Chinese effort which would nearly offset significantly reduced effort by Japan and Taiwan.

B. Squid Jiggers

With the demise of the high-seas pelagic squid driftnet fishery, squid jigging has become the dominant method for supplying the East Asian squid markets. Although the total number of Asian jiggers involved in this fishery will probably not expand much beyond its current level, these jiggers will probably fish in many different grounds, primarily off South America.

Traditionally, Japanese, ROK, and Taiwan jiggers have targeted squid in the waters of the Falkland Islands and New Zealand. In the early-1990s, effort has decreased sharply off New Zealand, and, to a lesser extent, in the Falkland Islands. Many Japanese and Taiwan jiggers are now fishing in Argentine waters as a result of new Argentine legislation which permits foreign fishing. Jiggers from Japan, the ROK, and Taiwan, are also jigging in Peruvian waters. Exploratory jigging by Asian jiggers is reportedly taking place in Mexico, Ecuador, and Brazil.

It is clear that the Asian jigging fleet is canvassing Latin American waters thoroughly in an effort to find lucrative stocks of Illex squid. One stumbling block for the expansion of this fishery is the high access fees demanded by coastal nations (e.g. Peru) which may make fishing in certain coastal areas unprofitable. It would not be surprising to see China, which currently has no distant-water jiggers, enter this fishery sometime in the mid-1990s. If China does so, it would

probably have financial backing from Taiwan companies and fish the same grounds as the Taiwan fleet.

Projection for Squid Jiggers

Effort in this fishery should increase slightly. The primary reason for this increase would be the introduction of Chinese effort in this fishery, while the effort by the other three Asian distant-water fleets should remain the same.

Although the demise of the driftnet fishery may make more vessels available for this fishery, the economics of this fishery (e.g. high costs of distant-water jigging with aging driftnet vessels, limited demand for increased squid supply) mitigate against significant expansion. It seems more likely that current Asian participants in the distant-water jigging fishery will explore various ways, such as joint ventures, and fishing in new grounds with comparatively low access fees, to find the most cost-effective way to obtain squid.

C. Driftnet Vessels

The United Nations moratorium on high-seas pelagic driftnet fishing has eliminated one of the major Asian distant-water fleets. All three participants in this fishery (Japan, the ROK, and Taiwan) have agreed to abide by the moratorium and have initiated conversion programs. These are designed to encourage alternate fishing methods, (e.g. squid jigging, tuna longlining, and saury fishing) or provide compensation to fishermen forced to retire (usually fishermen with older vessels which could not be profitably converted to alternate fishing methods). To determine precisely the current status of former driftnet vessels is extremely difficult, but no confirmed sightings of Japanese, ROK, or Taiwan driftnet vessels engaging in unauthorized driftnet fishing during 1993, have been reported.

Projection for Driftnet Vessels

Available information suggests many owners of older driftnet vessels are accepting compensation and are either tying their vessels up in port or selling them for scrap or for use as fishery aggregation devices. Owners of newer driftnet vessels are probably converting them to squid jigging or longline tuna fishing. The vessels converted to squid jigging will probably fish in coastal Latin America waters, while those converted to tuna longlining will probably fish in the Indian and Pacific Oceans.

D. Distant-water Tuna Vessels

Longliners: Until the early 1990s, this was the one sector which seemed to hold long-term promise for the Asian distant-water fishing fleets. The tuna longlining fleets from Japan, Taiwan, and the ROK were particularly successful in catching sashimi-grade tuna for the lucrative Japanese market. During the late 1980s and early 1990s, however, this concentration on sashimi-grade tuna led to a glut on the Japanese market.

Industry officials from Japan, ROK, and Taiwan have held a series of meetings and are trying to regulate their vessels' fishing activities. Increased fuel and labor costs had a particularly severe impact on Japanese longlining companies which sold many of their aging vessels to Taiwan and Korean companies. These companies then registered many of these vessels in so-called flag-of-convenience nations (e.g. Panama, Honduras).

Purse Seiners: This is one distant-water fishery that has plausible potential for future expansion. The number of Japanese, ROK, and Taiwan distant-water purse seiners has increased steadily in the early 1980s and may continue to do so in the mid-1990s. The amount of expansion will be limited, however, by market forces and efforts by coastal South Pacific island nations to regulate this fishery which has traditionally been conducted in their coastal waters.

Projection for Tuna Vessels

Longliners: Increased costs and depressed tuna prices in the early 1990s have made it possible for tuna longliner fleets from developing countries such as China and Indonesia to enter this sector. By the year 2000, this fleet could well be dominated by Chinese and Indonesian longliners with financial backing and expertise provided largely by Taiwan companies. Depleted stocks of northern and southern bluefin tuna should result in more extensive targeting of albacore, yellowfin, and bigeye tuna stocks in the southern Pacific and western Indian Oceans.

This shift in effort from developed to developing countries should result in approximately the same level of effort during the next few years. The search for the most commercially viable mode of operation described above for squid jiggers will also be much in evidence in this sector.

Purse Seiners: Asian distant-water tuna purse seiner effort should increase slightly. Although the high-tech nature of this fishery may preclude near-term Chinese involvement in this sector, it is possible that China will join this fishery by the year 2000. Should access to the central South Pacific tuna purse seine fishery become limited, it is possible that some distant-water Asian purse seiners will move to Indian Ocean skipjack and yellowfin grounds which remain relatively unexploited.

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3. *Suisan Shuho*, August 25, 1992, pp. 11-13.

4. U.S. Embassy Tokyo, November 22, 1991.

5. *Bill Atkinson's News Report,* March 24, 1993, p. 3. Other reports (e.g. *Suisan Shuho*, June 25, 1993) indicate as many as 19 Chinese trawlers may be deployed in the peanut hole.

6. *Nikkan Suisan Keizai Shinbun*, April 27, 1993.

7. *Nikkan Suisan Keizai Shinbun*, September 4, 1992.

8. *Nikkan Suisan Keizai Shinbun*, July 27, 1993.

Appendices

Appendix A.--Asia. Fishing vessels with a capacity greater than 500GRT, 1975-92.

Year	China	Japan	Korea	Taiwan	Total
			Number of Vessels		
1975	1	172	56	9	238
1976	1	168	55	10	234
1977	1	156	53	8	218
1978	1	139	55	9	204
1979	2	124	62	11	199
1980	3	112	63	11	189
1981	3	106	62	14	185
1982	3	93	66	15	177
1983	3	90	75	15	183
1984	4	96	77	15	192
1985	5	116	81	17	219
1986	7	156	84	17	264
1987	9	184	97	15	305
1988	9	220	101	15	345
1989	10	189	112	14	325
1990	10	75	114	17	216
1991	16	63	116	17	212
1992	26	46	125	20	217

Source: *Lloyd's Register of Shipping Statistical Tables,* London, UK, various years.

Appendix B.-- Asia. Number of distant-water vessels, by type of vessel, 1985-91.

Vessel Type	1985	1986	1987	1988	1989	1990	1991
				Number of Vessels			
China&							
N. Pacific Trawlers	5	NA	NA	5	NA	NA	15
Trawlers - Other Vessels	12	NA	NA	82	NA	NA	183
Tuna Longliners	-	-	-	-	-	-	-
Squid Jiggers	-	-	-	-	-	-	-
China Total	17	NA	NA	87	NA	NA	198
Japan#							
N. Pacific Trawlers	97	93	95	99	100	98	70
Trawlers - Other	225	213	220	215	196	182	145
Tuna Purse Seiners	35	38	34	39	37	35	45
Tuna Longliners	823	818	819	807	806	791	790
Squid Jiggers%	174	145	151	269	324	133	113
Driftnetters	422	445	440	428	451	359	276
Japan Total	1,776	1,752	1,759	1,857	1,914	1,598	1,439
Republic of Korea@							
Otter Trawlers	233	245	230	231	221	219	146
Shrimp Trawlers	NA	NA	NA	NA	NA	NA	112
Tuna Purse Seiners	NA	NA	NA	NA	NA	NA	32
Tuna Longliners	280	295	338	373	387	285	285
Squid Jiggers	33	32	35	38	46	90	98
Driftnetters	NA	NA	NA	NA	NA	NA	90
Other	105	104	107	119	145	188	4
ROK Total	651	676	710	761	799	783	771
Taiwan*							
Trawlers - Other	626	573	632	670	706	719	663
Tuna Purse Seiners	NA	NA	NA	NA	19	35	46
Tuna Longliners	542	610	653	698	779	841	759
Squid Jiggers	16	19	37	62	74	77	99
Driftnetters	3	2	2	3	12	14	14
Other	97	106	108	135	-	-	-
Taiwan Total	1,284	1,310	1,432	1,568	1,709	1,786	1,613
Grand Total	3,728	3,738	3,901	4,273	4,422	4,167	4,021

& - Data for the Chinese fleet comes from the following sources: 1985-various reports in fisheries press; 1988-*Fishing News International*, "China Expands Deepsea Fleet, December 1988; 1991-*Fishing News International*, "China Expands Deepsea Fleet," January 1992.

- Data for the Japanese fleet comes from the Fisheries Agency of Japan, *Gyogyo Yoshokugyo Seisan Tokei Nenpo*.

% - Japanese squid jigging statistics include coastal and off-shore catch until 1990.

@-ROK fleet data comes from the Ministry of Agriculture,Forestry, and Fisheries,*Statistical Yearbook of Agriculture, Forestry and Fisheries*.

* - Data for the Taiwan fleet comes from the Taiwan Fisheries Bureau, *Fisheries Yearbook-Taiwan Area*. Taiwan vessel statistics do not differentiate between distant-water and other fisheries. This table gives the number of all powered Taiwan fishing vessels greater than 100GRT, most of which are believed to be distant-water fishing vessels. Many distant-water driftnet vessels, however, had a tonnage smaller than 100GRT and are not counted here.

Appendix C.– Asia. Distant-water catch, by type of vessel, 1985-91.

Vessel Type	1985	1986	1987	1988	1989	1990	1991
				Metric tons			
China							
N. Pacific Trawlers@	1,600	3,200	16,529	18,419	31,139	27,826	121,254
Trawlers - Other&	22,419	88,845	88,947	104,729	100,000	100,000	100,000
Tuna Longliners	-	-	-	-	-	-	-
Squid Jiggers	-	-	-	-	-	-	-
China Total	24,019	92,045	105,476	123,148	131,139	127,826	221,254
Japan							
N. Pacific Trawlers	543,654	810,348	864,163	790,913	683,656	422,180	152,374
Trawlers - Other	388,716	447,895	552,730	549,703	475,194	402,771	333,076
Tuna Purse Seiners	139,697	156,749	136,899	168,617	140,594	158,874	169,493
Tuna Longliners	232,704	229,035	201,781	216,483	169,405	169,364	180,357
Squid Jiggers*	234,334	215,557	416,189	405,111	436,523	95,194	124,069
Driftnetters	140,963	121,773	165,058	130,283	141,263	145,342	86,566
Japan Total	1,680,068	1,981,357	2,336,820	2,261,110	2,046,635	1,393,725	1,045,935
Republic of Korea							
N. Pacific Trawlers	494,455	610,274	454,492	304,343	362,099	312,218	177,400
Trawlers - Other	95,741	104,281	131,373	129,676	150,928	163,486	181,360
Tuna Purse Seiners	11,279	27,732	58,752	79,397	115,754	173,343	227,518
Tuna Longliners	93,090	95,401	87,437	81,726	64,213	69,524	47,074
Squid Jiggers	11,809	45,917	86,311	92,359	120,854	88,843	150,039
Driftnetters	58,623	43,028	62,852	84,267	113,173	99,587	62,912
ROK Total	764,997	926,633	881,217	771,768	927,021	907,001	846,303
Taiwan							
Trawlers - Other	162,650	179,530	202,471	260,002	228,155	201,273	184,890
Tuna Purse Seiners	50,380	52,011	55,683	114,617	117,164	124,599	107,062
Tuna Longliners	119,232	151,233	146,414	147,615	139,113	155,921	134,574
Squid Jiggers	48,966	50,945	115,249	129,177	117,717	88,254	124,176
Driftnetters	55,512	46,282	67,930	62,146	118,131	163,146	142,308
Taiwan Total	436,740	480,001	587,747	713,557	720,280	733,193	693,010
Grand Total	2,905,824	3,480,036	3,911,260	3,869,583	3,825,075	3,161,745	2,806,502

@ - Data for 1985-90 are catch statistics submitted by Chinese Government to multilateral negotiations on Central Bering Sea fisheries. 1991 data is from Food and Agriculture Organization of the United Nations, *Fishery Statistics-Catches and Landings*, 1991.

& - Data for 1985-88 comes from Jie, et. al, "Reform and Development of China's Fisheries." The data for 1989-91 are estimates based on numerous fishery press reports which report average annual distant-water trawler catch to be approximately 100,000 tons.

* - Japanese squid jigging statistics include coastal and off-shore catch until 1990.

Sources: Fisheries Agency of Japan, *Gyogyo Yoshokugyo Seisan Tokei Nenpo.*; Ministry of Agriculture, Forestry, and Fisheries (ROK), *Statistical Yearbook of Agriculture, Forestry and Fisheries.* ; Taiwan Fisheries Bureau, *Fisheries Yearbook-Taiwan Area.*

Appendix D.-- Fish catch in the Central Bering Sea "donut hole" region, by country, 1985-92.

Country	1985	1986	1987	1988	1989	1990	1991	1992*
				Metric tons				
China	1,600	3,200	16,529	18,419	31,139	27,826	16,653	3,972
Japan	163,506	705,621	803,550	749,982	654,909	417,020	140,450	2,727
Republic of Korea	82,444	155,718	241,870	268,599	342,296	244,271	77,959	4,018
Poland	115,874	163,249	230,318	298,714	268,570	223,454	54,866	-
USSR/Russian Federation	-	12,000	34,000	61,000	150,700	4,800	3,471	-
Total	363,424	1,039,788	1,326,267	1,396,714	1,447,614	917,371	293,399	10,672

* - 1992 data is for January-June 1992.

Source: Data presented at Conferences on the Conservation and Management of the Living Marine Resources of the Central Bering Sea.

2

China

China possesses the only major Asian distant-water fishing fleet which is still growing significantly. Compared to its more developed East Asian neighbors, the Chinese distant-water fishing fleet is still in its infancy, having started in 1985 when 12 Chinese trawlers from Mawei, Fujian Province, began fishing in the eastern Atlantic off West Africa. The Chinese distant-water fleet has grown steadily since 1985, and should continue to grow for the foreseeable future.

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I. Distant-water Fishing Fleets

Statistics for the Chinese distant-water fishing fleet are scarce and extremely difficult to verify, but one source estimates that 319 Chinese distant-water fishing vessels caught approximately 300,000 tons (t) of fish in 1992.[1] Data from Lloyd's of London indicates there are 26 Chinese fishing vessels greater than 500 gross registered tons (appendix A). The majority of these vessels are probably stern trawlers, most of which are targeting groundfish in the North Pacific Ocean.

Catch data for the Chinese distant-water fleet is also scarce, but overall Chinese catch statistics indicate Chinese fisheries are rapidly expanding in all sectors (appendix B). Chinese catch tripled from 4.2 million tons in 1980 to 13.1 million t in 1991. Most of the increase can be attributed to increased harvests of freshwater carp species, but increased harvests are also evident among marine species. Chinese catch of the

most obvious distant-water catch species, Alaska pollock, remained unchanged at 20,000 t from 1987-90, but increased six-fold in 1991 to over 120,000 tons.[2]

Chinese distant-water fishing is planned, promoted, and controlled by the China National Fisheries Corporation (CNFC), a government-owned "company." The CNFC coordinates the activities of various provincial fishing companies (also government-owned) which are the owners of distant-water fishing vessels. Among these, the largest companies are located in Shanghai, Dalian, and Fujian. The CNFC has 12 overseas offices located in the United States, Uruguay, Argentina, New Zealand, Palau, the Russian Federation, Las Palmas, Spain, and five West African countries.

A. Trawlers

There are an estimated 120 Chinese distant-water trawlers which fish in the waters off West Africa, South America, Oceania, and the so-called donut and peanut holes in the North Pacific Ocean.[3] The majority of these vessels fish off the coast of West Africa, but the most economically significant fleet is the North Pacific stern factory trawler fleet.

The development of the Chinese North Pacific trawler fleet began in 1985 when China purchased 5 stern trawlers from the former East Germany for Alaska pollock fishing in the Central Bering Sea donut hole. The 5-vessel fleet caught only 1,600 t in 1985, but expanded rapidly to 16 vessels which caught 31,000 tons in 1989, with vessel sizes ranging from 1,000 to 3,000 gross registered tons.[4] Catches in 1990-92 decreased dramatically, however, reaching just 4,000 tons in 1992.[5]

According to the U.S. Department of Defense, Office of Naval Intelligence, China currently owns 30 fishing vessels having a capacity of at least 1,000GRT each (appendix C). Most are probably stern factory trawlers. The majority of these vessels were purchased from foreign countries, such as the former East Germany, Spain, France, Italy, Poland, and Japan.

The Shandong Fisheries Corporation of China purchased a 2,995GRT trawler from the Kyokuyo Fisheries Company of Japan in 1992 which was reportedly being deployed both in the donut hole and in the New Zealand exclusive economic zone (EEZ) for at-sea surimi processing. This was the second Japanese factory trawler purchased by China (the first was a Taiyo Fisheries Corporation trawler bought in 1990). Kyokuyo provided technical assistance and imported some of the Chinese-produced surimi.[6]

With the prohibition of donut hole fishing during 1993-94, it is difficult to pinpoint where the Chinese trawlers which fished in the donut hole are currently fishing, but it is believed that most, if not all, of the donut hole fleet has moved to the Central Sea of Okhotsk peanut hole. In response to the Russian Federation's June 1993 declaration of a ban on fishing for Alaska pollock in the peanut hole, China has offered to reduce its peanut hole catch by 25 percent in 1993 and participate in multilateral negotiations concerning the future management of this fishery.

B. Squid Jiggers

China does not yet have a squid jigger fleet. It would not be surprising, however, if Taiwan squid jigging companies began financing and deploying Chinese vessels on distant-water jigging grounds just as is being done in distant-water tuna fisheries (see I.D. Distant-water Tuna Fisheries).

C. Driftnet Vessels

Chinese fishing vessels did not engage in Government-licensed high-seas pelagic driftnet fisheries, but Chinese-flag vessels were first observed driftnet fishing in the fall of 1991. Chinese-flag driftnet vessels have also been observed in 1992 and 1993, but the Chinese Government has reiterated its support for the U.N. moratorium on high-seas pelagic driftnet fishing and has taken enforcement action against these vessels. Chinese Government officials believe that Chinese-flag driftnet vessels are actually from Taiwan, and that these vessels are using the Chinese flag to avoid punishment. Another explanation is that these vessels may be legitimate Chinese vessels which have moved their base to Taiwan after the Chinese Government revoked their registration.[7]

D. Distant-water Tuna Vessels

China has recently initiated distant-water tuna operations in the South Pacific. The exact number of Chinese vessels engaged in this fishery is unknown, but

the Japanese fisheries press estimates that there are 200 Chinese tuna vessels fishing off Palau and Micronesia.[8] The majority of these vessels are 19GRT class wooden vessels which operate in groups of five to ten vessels. Operating costs for these vessels are comparatively low which means that Chinese-caught tuna can be sold in Japanese markets at prices which China's developed Asian neighbors' (e.g. Japan, the ROK, Taiwan) tuna fleets can not match. Much of the capital for Chinese distant-water tuna fishing operations reportedly comes from Taiwan companies. Chinese tuna vessels at present do not have the deep-freezing technology of their more developed East Asian competitors, but Taiwan financial backing should pave the way for a Chinese ultra-low temperature freezer longliner fleet in the mid-1990s.[9]

II. Government Promotion of Shipbuilding

The Agricultural Bank of China issued huge loans to support Chinese fisheries as part of the Seventh Five-Year Economic Plan (1986-90), although it is unclear whether any of these loans were earmarked for building or purchasing fishery vessels. The loans extended by the Bank amounted to approximately $3.9 billion -- six times the amount spent during the Sixth Five-Year Plan (1981-85). The bank will continue to provide long and intermediate-term loans to the fisheries industry during the current Eighth Five-Year Plan period (1991-95), mainly to state and collective-owned firms.[10]

The major Japanese daily newspaper, *Asahi Shinbun*, reported in February 1993 that China will begin a 3-year program to invest approximately $6.6 billion for the development of a large-scale distant-water fishing fleet. The fleet would primarily consist of trawlers that would fish in the Indian Ocean, South Pacific, and the southeastern Atlantic. The Chinese Government will ask foreign governments for their cooperation in forming joint ventures and marketing fishery products caught by Chinese fishermen. Detailed information regarding the number and size of fishing vessels which might be constructed under this program is not available.[11]

III. Current Status of Shipbuilding

China has more than 100 state-owned shipyards which build fishing vessels.[12] These shipyards have a total labor force of approximately 50,000 and annually produce approximately 100 steel trawlers, averaging 300 gross registered tons. These shipyards also engage in vessel repairs, and aquaculture and fish processing equipment construction. Extensive trawler and purse seiner construction programs have been initiated since the 1970s to strengthen China's coastal fishing fleet, although no figures are available on the extent of this build-up.[13]

The two largest Chinese fishing vessel shipbuilders are the Dalian Fishing Vessel Company and Guangzhou Fishing Vessel Shipyard.[14] Both companies are capable of designing and building refrigerated vessels having less than 3,000GRT, and research vessels, enforcement vessels, and trawlers having less than 3,200GRT. The annual production of these two shipyards is approximately 40 vessels. According to the CNFC, some of these vessels have been exported to African and South American countries.

Another major shipyard is the Mawei Shipyard in Fujian Province in south-central China. This shipyard reportedly built eight trawlers and seiners worth $7 million for export to Peru in 1990.[15] The construction of these vessels was the result of a joint venture between the shipyard and a Hong Kong-based development company.

IV. Government Regulation of Fleet Sizes

There is no information available which indicates that the Chinese Government has taken any measures to regulate the number of the Chinese distant-water fishing vessels.

V. Vessel Imports

China's shipbuilding capacity has enabled it to be relatively self-sufficient in its needs for fishery vessels, with the important exception of the stern factory

trawler fleet operating in the North Pacific. The North Pacific trawler fleet is composed largely of aging vessels purchased from Japan, the former East Germany, Spain, France, and Poland.

Chinese Government import statistics for 1989-91 indicate that China imported large fishing vessels from the following countries: Japan-37 fishing vessels valued at $16.7 million, ROK-6 vessels valued at $3.6 million, Italy-1 vessel valued at $4.7 million, Spain-1 vessel valued at $3.3 million, Germany-2 vessels valued at $11.0 million, and Poland-1 vessel valued at $3.0 million. Chinese import statistics do not include gross registered tonnage, but judging from the value of these vessels, most of the imports from Japan, and all the imported vessels from Italy, Spain, Germany, and Poland were probably large factory trawlers.

VI. Access to Foreign Fishing Grounds

China has fishery agreements, cooperative arrangements, or joint ventures with at least 15 foreign entities: Spain, Guinea Bissau, Sierra Leone, Nigeria, Mauritania, Senegal, Morocco, Uruguay, Argentina, Chile, Mexico, the United States, New Zealand, the Marshall Islands, Palau, and the Russian Federation. In addition, China is exploring the possibility of a fisheries agreement with the Republic of Korea. Detailed information is available on the following countries:

A. Former Soviet Union/Russian Federation

China and the former Soviet Union signed a fisheries agreement in 1988 which established cooperation between the Soviet Far Eastern Fisheries Administration and the CNFC. Cooperation and technical exchanges have taken place in the fields of harvesting, aquaculture (particularly seaweed), processing, and fishing vessel repair. Chinese distant-water vessels gained access to Soviet waters in 1989 when 20 vessels reportedly fished off the Soviet Far East.[16] Chinese Government officials claim that none of the large factory trawlers engaged in the northwestern Pacific Alaska pollock fisheries are fishing in Russian waters.[17]

At the most recent meeting of the Russian-Chinese Commission on Fishing held in Moscow during December 1992, agreement was reached on the construction of a scientific research and production center for seafood products in Russia. The project will be operated by the Russian scientific production company, Primakvaprom, and an unnamed Chinese fish processing company. The main objective of the center will be to promote harvests of seaweed, king crab, scallops, oysters, sea cucumbers, and other underexploited species through modern scientific research. A Chinese company will design and construct the center. In compensation, China will receive a 1,000 t fish catch allocation in 1993 and a 1,000 t allocation in 1994 (species were not mentioned). Construction is scheduled to begin in 1994.[18]

B. East Asia

Republic of Korea: With the normalization of relations between China and the Republic of Korea in 1992, a report described an ROK-Chinese joint venture in China's Shandong Province. The ROK Dongwon Company reportedly teamed up with the Shandong Province Government to provide $20 million in start-up capital for the Yuanyun Marine Product Company, an aquaculture and fish processing concern.[19]

C. Oceania

Marshall Islands: China has reportedly signed a memorandum of understanding with the Marshall Islands which could provide access to Marshall Islands waters for up to 50 Chinese longliners.[20]

Federated States of Micronesia: China is reportedly negotiating for access to Micronesian waters. The Taiwan-owned Ting Hong Oceanic Enterprise Company, Limited, reportedly operates 104 China-flag and Taiwan-flag vessels out of Yap.[21]

New Zealand: Chinese vessels have fished in New Zealand waters since the introduction of the Quota Management System (QMS) in 1991. Under the QMS, only New Zealand companies and/or citizens may own a fishing quota, and foreign investment in New Zealand companies is limited to 24.9 percent. Quota holders may choose to use their own vessels or charter foreign vessels to catch their quota.

Under a charter arrangement, a foreign vessel is hired to catch a quantity of fish which a New Zealand

company owns. Chartered foreign fishing vessels catch approximately 60 percent of the entire catch in the New Zealand EEZ. An estimated 100 foreign fishing vessels will be hired under charter arrangements in the 1992/93 fishing year. These vessels come from many countries, including China. The chartered vessel catch is composed largely of groundfish species, such as hoki and southern blue whiting, and squid.[22]

Palau: The Zhong Yuan Fisheries Company is a joint venture company in Palau which was formed by the CNFC, and the Fujian, Shantou, Hainan, and Northsea Marine Fisheries Companies. The Chinese companies have formed this tuna fishing venture with Palau International Traders Incorporated (PITI). Only exploratory fishing had been conducted by this venture as of 1990 when it reportedly operated 23 longliners. An unspecified number of pole-and-line vessels were also used, but this fishing technique was abandoned because of "operational difficulties." China planned to operate 30 longliners off Palau in 1991 with a catch target of 800-1,000 t of tuna for export to the Japanese sashimi market. Part of the catch is flown to Japan via Guam; the rest is transshipped to Japanese carriers.

The most recent information available indicates that 30 Chinese longliners participate in the PITI joint venture, with an additional Chinese longliner participating in a Chinese/Taiwan joint venture called Palau Marine Industries Corporation.[23] The Japanese fisheries press estimates there are as many as 120 Chinese vessels operating in Palau.[24]

D. Africa/Middle East

A fleet of 12 Chinese trawlers (200GRT class) and one refrigerated transport vessel (850GRT) began fishing in waters off the West African countries of **Guinea Bissau**, **Senegal**, and **Sierra Leone** in 1985.[25] At that time, six vessels fished off Guinea Bissau, four vessels fished off Senegal, and two vessels fished off Sierra Leone. Target species were hairtail, sea bream, and cuttlefish for the domestic Chinese market. Some of the catch, however, was sold to major Japanese fishery companies such as Taiyo and Nissui. These two companies also sent technical advisors to assist the Chinese.[26]

Guinea Bissau: China has a government-to-government fisheries agreement with Guinea Bissau which allowed 12 Chinese fishing vessels access to Guinea-Bissau waters in 1990. In exchange for access, China is providing assistance in fishing vessel construction and resource survey techniques.

Las Palmas, Spain: The CNFC participates in a joint venture with CIFIDECO Spain, a branch of CIFIDECO Ltd. (registered in Hong Kong), China International Trust and Investment Company, and CEDECO Italy. Las Palmas is the base for the Chinese distant-water fleet in West Africa and this joint venture provides overall support services to the Chinese fleet.[27]

Mauritania: China signed a fisheries agreement with Mauritania in August 1991. Few details are available, other than that the agreement calls for cooperation in all aspects of fisheries.[28]

Morocco: The CNFC and China International Trust and Investment Company have formed a joint venture called MAC-FISHERY with the GROUPE SONARP MOROCCO. The company initially owned 4 fishing vessels which fished in the Morocco EEZ. MAC-FISHERY planned to deploy 6 new Chinese-built vessels in 1990.

Nigeria: Dolphin Fisheries Ltd. is a joint venture with the CNFC in Nigeria. The joint venture operates 4 vessels and is engaged in fishing, exporting, and marketing operations.

Senegal: China has formed a joint venture company called SOACHIP S.A. in Senegal. The venture consists of the CNFC and the AFRICAMER Co. Ltd. The venture company owns 6 fishing vessels and is involved in harvesting, marketing, and fishing vessel repair operations.

E. Latin America

Argentina: CIFIDECO Ltd. joined forces with GERPESCA S.A. of Argentina to form the joint venture company, CIFIDECO Argentina S.A. This company is engaged in fisheries trade and aquaculture operations. Another joint venture company, CODEPECA S.A., was founded by CIFIDECO Argentina S.A. and HARANGUES S.A. The CNFC's Dalian shipyard is building fishing vessels and providing labor for this joint venture. A total of 4 vessels were involved in this venture at the beginning of 1989, with plans to expand the fleet to 11 vessels in

the future. The joint venture's catch was reportedly shrimp, squid, and hake.[29]

Chile: The China Agriculture Trust and Investment Corporation has reportedly purchased shares worth $19 million from the Chilean fish processing company, San Johe de Corporation. This purchase gave the Chinese company a 26 percent stake in the company and is the largest investment by a Chinese concern in Latin America. The Chilean company owns 17 fishing vessels and two processing plants, whose annual output is 3.6 million cartons of canned fish, in addition to fish meal and fish oil. Nearly 75 percent of production is exported to the United States and Canada.[30]

Mexico: China was expected to sign a joint venture fisheries agreement with Mexico in early 1993 involving aquaculture (fish and shrimp) and processing operations.[31] It is unclear whether this agreement was ever signed.

F. North America

United States: China has had a Governing International Fisheries Agreement with the United States since 1985 which allowed China access to U.S. fishery resources. With the Americanization of the U.S. EEZ, however, China received smaller and smaller allocations, and currently receives no allocation in the U.S. 200-mile zone.

VII. Outlook

The Chinese Government believes that Chinese fisheries catch could surpass 20 million tons by the year 2000, thanks to increased aquaculture harvests and the introduction of market economics in the fisheries sector. Chinese officials have announced that future Chinese fisheries policy will emphasize the expansion of distant-water fishery operations as one way to reach this 20 million t target.[32]

Since China has already reported a total catch of 15 million t in 1992, such an ambitious target is not entirely out of the question. Although distant-water catch may never comprise more than 5 percent of the total Chinese catch by quantity, it may comprise a more significant share of Chinese fisheries by value. Judging from current trends, it appears obvious that China's distant-water fleet will take over some of the effort relinquished by Japanese, ROK, and Taiwan fleets, particularly in Pacific Ocean distant-water trawler and tuna fisheries. It is unclear whether China plans to initiate operations in distant-water squid fisheries, but China's plentiful and cheap labor gives it a considerable advantage over its developed Asian competitors.

A. Trawlers

Chinese distant-water trawler effort in the mid-1990s will probably focus on three fishing grounds: 1) the peanut hole in the Sea of Okhotsk, 2) the East Atlantic off the coast of West Africa, and 3) the South Atlantic and Pacific off the coasts of Argentina and Chile. Domestic political pressure within the Russian Federation to close the Sea of Okhotsk to foreign fishing has made this fishery's future uncertain, so China may attempt to strengthen its presence in coastal West African, and southwest Atlantic and southeast Pacific fisheries. The catch off coastal Africa will probably supply the domestic market while catch off South America (primarily Argentina and Chile) could soon become the most commercially significant of all Chinese trawler operations, given the relatively high market value of groundfish and related processed seafood products such as surimi.

B. Squid Jiggers

China currently has no squid jigging fleet, but will probably become involved in this fishery during the next five years with financial backing from Taiwan partners. If Chinese jiggers begin fishing, they will probably focus on the southwest Atlantic fisheries off Argentina and the Falkland Islands currently favored by the Taiwan jigging fleet.

C. Driftnet Vessels

Chinese driftnet vessels, in all likelihood re-flagged Taiwan driftnet vessels, will probably convert to tuna longlining or squid jigging operations. The driftnet vessels which convert to longlining will probably fish in China's new south Pacific distant-water tuna fisheries. Chinese vessels converting to squid jigging will probably participate in the southwest Atlantic squid fishery.

D. Distant-water Tuna Vessels

The number of Chinese vessels participating in this fishery will probably increase dramatically in the next five years, largely because this is potentially the most lucrative distant-water fishery. There is a strong possibility that Taiwan distant-water tuna longliner companies will invest heavily in outfitting Chinese tuna longliners with the super low-temperature freezing technology necessary for successful exporting to the Japanese sashimi-grade tuna processing industry. Taiwan's technology, combined with China's cheap and abundant labor, makes for a profitable combination which may someday result in a pan-Chinese monopoly of this lucrative fishery. In the short-term, Chinese vessels will continue to be centered in the South Pacific. In the long-term, Chinese tuna vessels could well move into Indian Ocean tuna fisheries.

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1. "Target Hit," *Fishing News International*, January 1993.

2. This FAO data is not entirely consistent with data submitted to Conferences on the Conservation and Management of the Living Marine Resources of the Central Bering Sea (see Overview, Appendix D). Chinese data submitted to the Conferences indicates Chinese Alaska pollock catch in the donut hole peaked at 31,000 t in 1989 and then decreased to a 1992 preliminary total of just 4,000 t. The Chinese 1991 Alaska pollock catch of 120,000 t must therefore include a significant catch in the Sea of Okhotsk peanut hole. It is unclear why the Chinese Government reported catches of 20,000 t to FAO in previous years.

3. "Overseas Fishing Fleet to Double by 1995," *China Daily (Business Weekly)*, 11 August 1991, p. 4.

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Appendices

Appendix A.-- China. Number of fishing vessels, ranked by tonnage, 1975-92.

Year	Gross Registered Tons (GRT)			Total
	500-999	1,000-1,999	Over 2,000	
	Number of vessels			
1975	1	-	-	1
1976	1	-	-	1
1977	1	-	-	1
1978	1	-	-	1
1979	2	-	-	2
1980	3	-	-	3
1981	3	-	-	3
1982	3	-	-	3
1983	3	-	-	3
1984	4	-	-	4
1985	4	-	1	5
1986	3	1	3	7
1987	3	1	5	9
1988	3	1	5	9
1989	3	2	5	10
1990	3	2	5	10
1991	4	2	10	16
1992	9	2	15	26

Source: *Lloyd's Register of Shipping Statistical Tables,* London, UK, various years.

Appendix B.-- China. Catch by species, 1980, 1985-91.

Species	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Common Carp	-	237,900	354,200	522,600	584,600	460,532	522,369	594,476
Crucian Carp	-	71,400	88,500	104,500	116,900	205,044	211,584	218,908
Grass Carp	-	356,900	442,700	522,600	584,600	934,537	1,023,199	1,045,962
Silver Carp	-	999,300	1,180,600	1,324,000	1,481,000	1,336,050	1,398,680	1,360,969
Bighead Carp	-	475,800	590,300	627,100	701,500	628,730	658,208	680,434
White Amur Bream	-	119,000	147,600	174,200	194,900	144,358	161,615	153,309
Nile Tilapia	-	23,800	29,500	34,800	39,000	89,473	106,071	119,852
Freshwater fishes	1,163,328	433,222	473,102	558,370	627,758	773,586	867,923	1,045,748
Alaska Pollock	-	-	-	20,000	20,000	20,000	20,000	121,254
Filefishes	161,365	272,674	426,918	407,210	263,294	392,068	337,189	285,601
Scads	-	233,883	238,079	344,753	251,170	300,000	387,896	419,849
Spanish Mackerel	51,457	90,623	94,218	99,006	124,810	148,079	208,569	200,643
Hairtail	473,315	458,723	406,403	393,606	365,730	416,202	497,733	559,358
Chub Mackerel	83,760	92,573	132,196	166,039	240,699	231,625	196,823	242,639
Marine Fishes	1,240,738	1,263,439	1,495,065	1,673,215	1,965,411	2,269,268	2,502,031	2,747,803
Freshwater Crustacheans	51,625	55,411	62,021	80,626	84,740	95,544	94,730	107,180
Gazami Crab	-	-	-	108,518	99,138	143,474	135,370	148,962
Marine Crabs	254,000	339,476	328,337	304,678	350,713	438,624	403,030	510,611
Chinese White Shrimp	-	73,188	112,232	187,058	253,895	211,100	223,231	225,560
Akiami Paste Shrimp	133,102	209,120	175,207	162,366	190,589	217,278	211,365	217,081
Sea Mussels	67,200	128,860	210,657	212,680	429,675	490,514	495,895	498,183
Japanese Scallop	-	8,312	23,686	43,640	121,991	129,461	147,003	160,000
Japanese Clam	-	31,482	41,603	53,389	63,042	87,098	109,702	164,024
Razor Clam	-	125,717	126,175	133,597	140,673	138,467	140,326	165,230
Marine Molluscs	-	186,217	284,437	381,161	436,461	319,999	350,975	350,806
Other	555,458	491,799	536,327	706,510	626,389	599,385	683,846	790,525
Total	4,235,348	6,778,819	8,000,063	9,346,222	10,358,678	11,219,994	12,095,363	13,134,967

Source: United Nations Food and Agriculture Organization, *Fishery Statistics-Catches and Landings.*

Appendix C.-- China. Fishing vessels exceeding 1,000 gross registered tons, by vessel name, tonnage, country and year built, 1993.

Vessel Name	Vessel Class	GRT	Country of Origin	Year Built
Bai Ling Hai	NA	3,926	Japan	1968
Bei Dou	NA	1,165	Norway	1984
Fu Xing Hai	Kalmar Mod B	2,374	Poland	1977
Geng Hai	Karlsburg Fishing	3,577	East Germany	1973
Hai Feng	Hai Feng	2,500	China	1960
Hai Feng 101	NA	1,941	Japan	1967
Hai Feng 2021	Hai Feng 2021	1,908	Japan	1975
Hai Feng 2022	Hai Feng 2021	1,908	Japan	1975
Hai Feng 2023	Hai Feng 2021	1,909	Japan	1975
Jiang Leng 2	Beijing 1	1,219	France	1956
Jinshui Jil	Yuyo Maru Fish	5,044	Japan	1961
Kai Chuang	Regulus	3,180	East Germany	1973
Kai Fa	Wlocznik	2,584	Poland	1977
Kai Feng	Wlocznik	2,603	Poland	1976
Kai Tuo	NA	1,594	Italy	1975
Kai Xin	Friopesca Uno	2,305	Spain	1989
Liao Da Shui X 3	Liao Da Shui X 3	1,500	China	1974
Ming Chang	Prometey	3,169	East Germany	1977
Ming Zhu	Prometey	3,913	East Germany	1976
Sui Shang 301	Sui Shang 301	7,731	UK	1937
Tai An	NA	2,749	Japan	1964
Tai He	Prometey	3,169	East Germany	1977
Yan Yuan San Hao	NA	2,703	Spain	1976
Yan Yuan Yi Hao	Karlsburg Fishing	3,577	East Germany	1973
Yan Yuan 2	Kalmar Mod A	2,405	Poland	1977
Yen An 5	Chichibu Maru 2	1,477	Japan	1961
Yu Leng 4	Yu Leng 4	1,000	China	NA
Yun Hai	Kalmar Mod A	1,585	Poland	1980
Zhong Guo Yu Zheng 21	Zhong Guo Yu Zheng 21	2,000	China	1979
Zuiyo Maru 2	NA	3,403	Japan	1966

Source: U.S. Department of Defense, Office of Naval Intelligence, August 1993.

3

Japan

Japanese companies have historically owned the largest distant-water fishing fleet in Asia. Japan is also the country where the difficulties for a developed economy to sustain a distant-water fishing fleet are most clearly apparent. The main difficulties are: 1) the inability to attract young job seekers to distant-water fisheries, 2) constantly increasing wages, 3) increasingly depleted foreign coastal fishery resources, and 4) increasingly restricted and expensive access to distant-water fisheries. In fact, many of Japan's largest fishery companies are changing the focus of their efforts from capture fisheries to diversified agri-business activities (e.g. value-added processing, restaurants).

Japanese distant-water fishing fleets have operated all over the world since the end of World War II. Prior to the signing of the United Nations Convention on the Law of the Sea (UNCLOS) in December 1982, Japanese vessels had access to almost all commercially important fishing grounds, both on the high-seas and in foreign coastal waters. With the advent of UNCLOS, however, many coastal nations began to enforce their Exclusive Economic Zones (EEZ) which greatly restricted Japanese access to prime foreign coastal fishing grounds. The "fisheries nationalization" policies of many countries, including the United States and Canada, forced the Japanese high-seas fisheries industry to seek new fishing grounds and business elsewhere.

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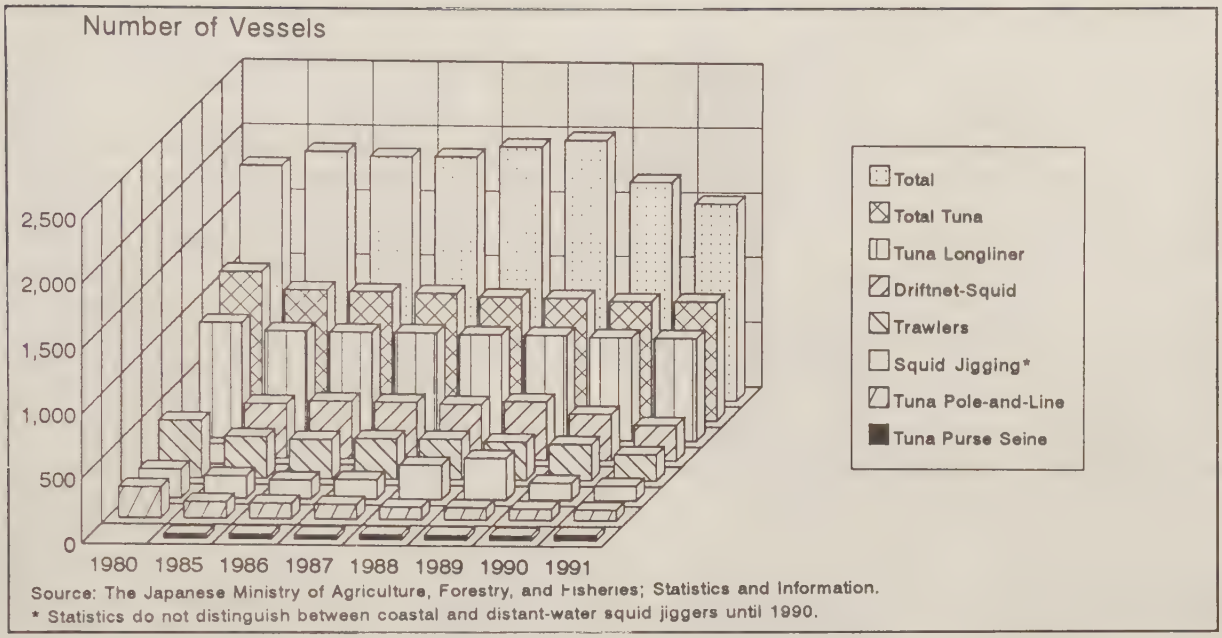

Figure 1. Japan. Number of distant-water fishery vessels, by vessel type; 1985-91.

I. Distant-water Fishing Fleets

Fleet statistics from Lloyd's of London for Japanese fishing vessels having more than 500 gross registered tons indicate that the Japanese distant-water fleet is rapidly diminishing in size (appendix A). The total number of Japanese fishing vessels decreased more than threefold from 1975 to 1992, with vessels in the 500-999GRT class showing the most dramatic decrease. In addition, the number of Japanese fishing vessels having more than 100GRT has declined since 1989 (appendices B and C). The decline has been particularly pronounced in the larger size classes (appendix C, figure 1), which consist mostly of factory trawlers.

The distant-water fleet has decreased dramatically, from 2,008 vessels in 1989 to 1,521 vessels in 1991 (appendix D). Distant-water trawlers, particularly those engaged in the North Pacific, showed the most dramatic reductions in fleet size. The only distant-water fleet showing growth was the Japanese distant-water tuna purse seine fleet.

Japanese catch statistics also indicate an industry in decline (appendix E). The overall catch peaked at 12.8 million tons (t) in 1988, and has decreased significantly in each succeeding year, falling to 10.0 million t in 1991. The share of the total Japanese catch contributed by distant-water fishing has also decreased steadily over the years from 20 percent in 1980 to 12 percent in 1991. All indications are that this trend will continue into the next century.

From a peak catch of 2.5 million t in 1987, the Japanese distant-water catch has fallen nearly 50 percent to 1.2 million t in 1991 (appendix E). By vessel type, the most pronounced decreases were in the trawl fisheries, particularly the North Pacific trawl fisheries. The only gear type which showed consistent growth between 1989-91 was the tuna purse seine catch, which increased nearly 40 percent (appendix F, figure 2).

A. Trawlers[1]

The Japanese distant-water trawl fleet numbered 445 vessels in 1980, but decreased steadily during the next 10 years to a total of only 215 trawlers in 1991 (appendix D). The primary reasons for this decrease are the demise of the so-called donut hole fishery in the Central Bering Sea and the increasingly scarce allocations of foreign coastal groundfish resources (e.g. South Africa).

There are five basic classifications of distant-water Japanese trawlers: northern, converted (*tenkan*),

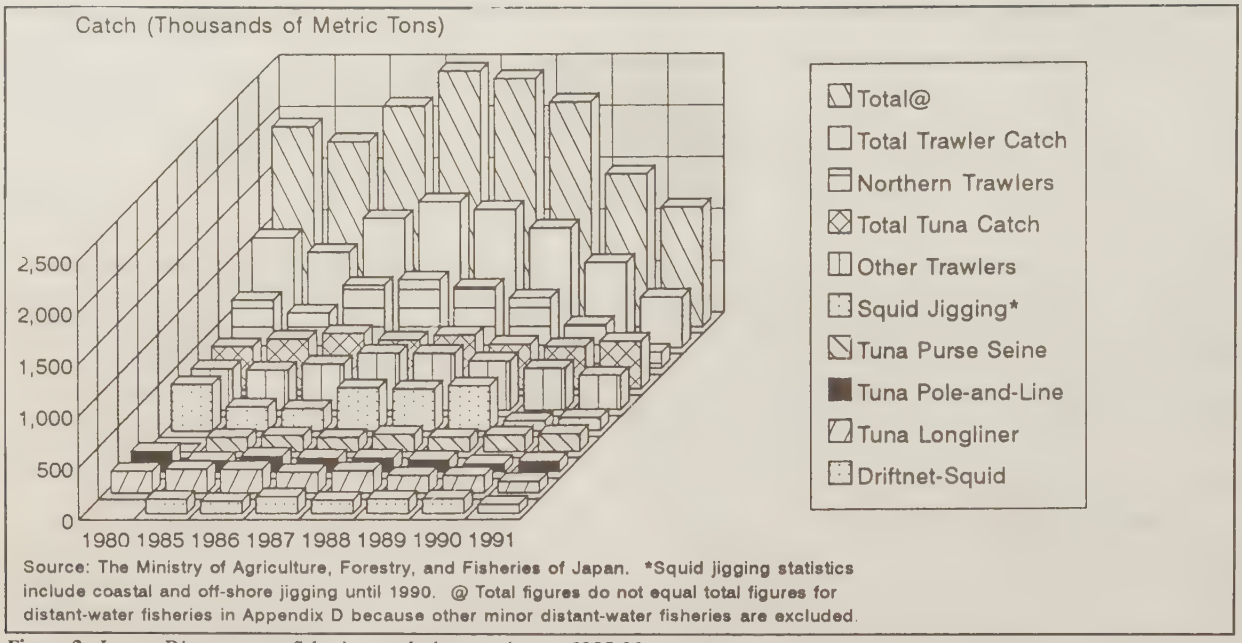
Catch (Thousands of Metric Tons)
2,500
2,000
1,500
1,000
500
0
1980 1985 1986 1987 1988 1989 1990 1991
Total@
Total Trawler Catch
Northern Trawlers
Total Tuna Catch
Other Trawlers
Squid Jigging*
Tuna Purse Seine
Tuna Pole-and-Line
Tuna Longliner
Driftnet-Squid
Source: The Ministry of Agriculture, Forestry, and Fisheries of Japan. *Squid jigging statistics include coastal and off-shore jigging until 1990. @ Total figures do not equal total figures for distant-water fisheries in Appendix D because other minor distant-water fisheries are excluded.

Figure 2. Japan. Distant-water fisheries catch, by vessel type; 1985-91.

hokuten, southern, and shrimp. Trawlers in the first three classifications fish almost exclusively in the waters of the North Pacific. There is also a North Pacific longliner fleet which primarily targets cod in Russian Federation waters. The longline fleet will be discussed in this section because its primary target species, like its trawler counterparts, are groundfish.

Northern trawlers: These are defined as those distant-water trawlers which fish in an area north of 10 degrees north latitude, and east of 170 degrees east longitude in the waters of the Pacific Ocean (including the Bering Sea). In 1980, 40 trawlers were licensed by the Japanese Government under this classification, but this number decreased to just 12 trawlers in 1991 (appendix G). Northern trawlers are the largest of the distant-water Japanese trawlers, with a minimum capacity of 500GRT. Until 1989, these vessels primarily conducted surimi trawl operations in joint ventures with U.S. companies and on the high-seas region of the Central Bering Sea known as the donut hole. With the elimination of the U.S. joint venture quota in 1990, these vessels fished solely in the donut hole fishery. Catch statistics show that northern trawl catch was composed almost entirely of Alaska pollock, especially in recent years (appendix H).

Trawling operations conducted by major Japanese fishery companies once comprised a sizeable portion of northern trawler fishing activity, but this fishery seems to be one whose time has passed. Four of the six major Japanese fishery companies (Nichiro, Kyokuyo, Hoko, and Hosui) have completely withdrawn from trawling. The other two major companies, Nissui and Taiyo, have drastically reduced their trawling operations. Nissui currently operates 8 trawlers and Taiyo operates 5 trawlers, all of which are deployed in southern trawl fisheries.[2]

The majority of the Japanese northern trawl fleet has been exported or redeployed to other fishing grounds (appendix I). At least four northern trawlers have been exported to Argentina, and two have been exported to China. Other northern trawlers have been exported to Somalia/Honduras,[3] the former Soviet Union/Russian Federation, Cyprus, India, and the United States. Another five northern trawlers are now operating in southern trawl fisheries. The prime reason for this shift in effort was the collapse of the donut hole Alaska pollock stocks and the realization among large Japanese fishery companies that large factory stern trawler fishing operations were becoming increasingly unprofitable, mainly because of rising fuel and labor costs.

Converted trawlers (*Tenkan*): These trawlers are defined as those distant-water trawlers which fish in an area north of 50 degrees north latitude, and east of 170

degrees east longitude in the waters of the Pacific Ocean (including the Bering Sea), or east of 170 degrees west longitude in the Bering Sea. The vessels are termed "converted" because this fleet consisted of 16 former mothership-type trawlers when it was established in 1976. The fleet consisted of 16 vessels in 1980 and decreased to 11 vessels as of 1991 (appendix G). Vessel size ranges from 380-660 gross registered tons. The operations of this fleet have generally coincided with that of the northern trawl fleet. The catch of this fleet is also mostly Alaska pollock (appendix H).

***Hokuten* trawlers:** These trawlers are defined as those distant-water trawlers which fish in an area north of 48 degrees north latitude, and east of 153 degrees east longitude, or west of 170 degrees west longitude in the Pacific Ocean, including the Bering Sea and Sea of Okhotsk. In addition, these trawlers fish in an area north of 57 degrees north latitude, east of 170 degrees west longitude, and west of 166 degrees west longitude in the Bering Sea. The fleet consisted of 54 vessels from 1985-90, but decreased to 47 vessels in 1991 (appendix G). Vessel capacity ranges from 280-350 gross registered tons.

These vessels originally concentrated their efforts on grounds in the waters of the United States and the former Soviet Union, but with the reduction in U.S. and Soviet allocations during the 1980s, this fleet began to conduct operations in the donut hole as well as in Soviet waters. After the Soviet Union prohibited bottom trawling in 1991, the *hokuten* fleet was compelled to rely primarily on the donut hole fishery. In 1991, however, trawlers from this fleet also participated in joint trawling with the Soviets in waters off southern Kamchatka. *Hokuten* trawler catch is comprised largely of Alaska pollock, with lesser amounts of cod, flatfish, rockfish, and miscellaneous other fish (appendix H).

The Japanese Government announced a compensation plan in November 1991 which encouraged operators of small and medium-sized trawlers, primarily *hokuten* trawlers, to retire their vessels between 1991-94 in exchange for $1.9-$3.2 million per vessel in compensation.[4]

Northern longliners: In addition to the North Pacific trawler fleet, there is also a northern longline fleet. The fleet primarily targets cod and rockfish and fished in U.S waters until 1989. When access to U.S. waters was terminated, the former 22-vessel fleet decreased to 12 vessels. Since the fleet can no longer operate in U.S. waters, it has relied on operations in the waters of the former Soviet Union. In 1989, the Japan-Soviet fisheries joint venture, Magadan Fisheries, was established. The northern longline fleet has conducted joint operations in Soviet/Russian waters since 1990 under this joint venture.

Southern trawlers: These trawlers can be broadly defined as the Japanese trawl fleet which operates outside of the North Pacific donut hole and Russian EEZ fisheries. An 8-vessel southern trawl fleet initially began operations off New Zealand, Australia, and the west coast of Africa in 1959. The fleet grew rapidly during the 1960s and exploratory fisheries were conducted worldwide, from waters off Argentina, to those of the Northwest Atlantic (including Greenland), and the Indian Ocean.

The size of the Japanese southern trawl fleet decreased from a high of 99 vessels in 1986 to just 62 vessels in 1990 (appendix J).[5] The primary reason for this decrease is that foreign allocations for the Japanese southern trawl fleet have diminished greatly over the years (appendix K). Total southern trawler quotas reached a peak of 176,000 t in 1985, but rapidly diminished to just 41,000 t in 1991. The reduction in allocations is reflected in southern trawler catch statistics which show a decrease in catch from 450,000 tons in 1988 to just 322,000 t in 1990 (appendix L).

In the late 1980s, its fishing effort was concentrated in grounds of the southwest Atlantic and New Zealand. Target species in the southwest Atlantic are jack mackerel (off Chile), Atlantic cod, and sea bream (off Argentina). Target species off New Zealand are hoki, jack mackerel, barracuda, and squid.[6] Between 1986-90, an increasing proportion of southern trawler catch came from New Zealand (appendix L). The percentage of southern trawler catch in New Zealand increased from 67 percent in 1986 to 83 percent in 1990.

Southern trawl high-seas fishing grounds:
The high-seas of the **Southwest Atlantic** was a fertile ground for Japanese southern trawlers until the late 1980s. Since the high-seas squid ground is small in size and borders the EEZs of Argentina and the Falkland Islands, there has been strong Japanese

industry interest in gaining access to these coastal EEZs (for details, see Section VII-Access to Foreign Fishing Grounds).

Vessel statistics for the Japanese southern trawl fishery show that the southwest Atlantic fleet decreased from 27 to 7 trawlers between 1987 and 1990 (appendix J) while the overall southern trawler squid catch decreased from 90,000 t to 10,000 t (appendix M). Although catch by species by fishing ground statistics for the southern trawl fleet are not available, a good deal of this squid was probably caught in the Southwest Atlantic.

In the high-seas of the **Northwest Atlantic**, Japanese trawlers have been fishing primarily for redfish, capelin, and squid with allocations granted by the International Commission for the Northwest Atlantic Fisheries and its successor organization, the Northwest Atlantic Fisheries Organization (NAFO).

Japanese southern trawlers have targeted krill in the high-seas waters of **Antarctica**. Krill is considered a potential source of protein for human consumption, but recent attention has focused more on its use as bait or as an animal feed ingredient. A total of 7-8 Japanese trawlers participate annually in this fishery, with catches ranging from 60,000 to 80,000 tons (appendices J and L).

Shrimp Trawlers: The Japanese distant-water shrimp trawler fleet has consisted of approximately 60 vessels which fish in the Atlantic off the South American countries of Colombia, Guyana, Suriname, and Brazil (Note: Japan secured access to Nicaraguan waters in 1986, but has not fished there because of political instability). The vessels are generally 68GRT class trawlers with 4-5 man crews. As competition with foreign fleets and conditions for access have become increasingly stringent, catch figures have decreased gradually and dropped below the 1,000 t level for the first time in 1990 (appendix N).

East China Sea Trawlers: This fleet is primarily composed of small trawlers, averaging 135GRT, which target finfish sold on the domestic market. The size of this fleet and its corresponding catch have diminished rapidly in the past 10 years. A total of 213 trawlers caught nearly 200,000 t of fish in 1980, but in 1991 a total of 112 trawlers caught 80,000 t of fish (appendices D and F). The outlook for this fleet is particularly bleak because of depleted stocks, aging vessels, and a labor shortage.

B. Squid Jiggers

With the demise of the high-seas pelagic squid driftnet fleet, the Japanese squid jigging fleet has become the primary Japanese distant-water squid fleet. Japanese distant-water squid jiggers concentrate their effort in two fishing grounds: New Zealand's EEZ and coastal areas of South America (see Section VII-Access to Foreign Fishing Grounds). During the 1990/91 season, 82 Japanese squid jiggers operated in the southwestern Atlantic and 29 jiggers operated in New Zealand (appendix O). The fleet has gradually decreased in size from its peak of 172 vessels in the 1987/88 season to its 1990/91 level of 111 vessels. The fleet's catch mirrors the decline in vessel numbers, falling from its peak of 230,000 t in 1987/88 to just 117,000 t in 1990/91.

The most recent vessel and catch data for this fleet indicates a shift in effort from traditional grounds off the Falkland Islands and New Zealand, to new grounds off Argentina, Peru, and Brazil. A total of 33 Japanese jiggers caught 28,000 t of squid in the Falkland Islands EEZ in the 1992/93 season, a big decrease from the 76,000 t caught in this fishery during 1991/92. The primary reason for this decrease was that most of the effort in the Falklands fishery was shifted to the Argentina EEZ, where Japanese jiggers were allowed to fish for the first time. Japanese jiggers caught 81,000 t of squid in Argentine waters during the 1992/93 season. The decline in effort continues in New Zealand where 8 Japanese jiggers caught just 3,800 t of squid in the 1992/93 season, compared to 6,100 t in 1991/92. There are 22 Japanese jiggers deployed in Peruvian waters which have caught 9,000 t during the still-continuing 1992/93 season. Japanese catch in Peru has increased dramatically and reached 41,600 t in 1991/92. The search for alternative jigging grounds continues in 1993 as three Japanese jiggers conduct exploratory fishing off the coast of Brazil.[7]

C. Driftnet Vessels

Japan has conducted distant-water driftnet fisheries for tuna/billfish and squid in the North Pacific Ocean, and for albacore tuna in the South Pacific. Japan began its squid driftnet fishery in 1978. The fishery targeted

large neon flying squid (*akaika*), which are found in loose aggregations throughout the North Pacific. In 1991, 454 vessels ranging from 50-500GRT were licensed for this fishery (appendix P). Only the Japanese tuna longliner fleet exceeded the size of the driftnet fleet at this time. At its peak in 1990, the driftnet squid fleet supplied over 25 percent of Japanese squid (appendix Q).

Only 12 percent of this fleet was devoted exclusively to squid driftnet fishing in 1991 (appendix R). The majority of vessels in this fleet were also participating in other fisheries (e.g. billfish driftnet, saury) during the off-season for the squid driftnet fishery (appendix S).

In the wake of United Nations General Assembly Resolution 46/215, which declared a moratorium on high-seas pelagic driftnet fisheries effective on January 1, 1993, the Japanese Government began to formulate plans to accommodate Japanese fishermen affected by the driftnet ban. One plan involved the initiation of exploratory squid jigging in the high-seas squid driftnet fishing ground. The exploratory fishery was unsuccessful, however, averaging a squid catch of less than one ton per day of fishing per vessel. This amounted to less than one-fifth of the squid caught during the same period by a driftnet vessel. The Government also conducted exploratory fishing in this ground with mid-water trawling gear, but with disappointing results.[8] In light of these discouraging results, the Japanese Government devised a compensation program for the former driftnet fleet.

The Japanese Government will offer compensation to high-seas squid driftnet vessel owners for three years (1992-94) and to owners of high-seas large-mesh driftnet vessels (used primarily in the tuna/billfish fishery) for one year (1992) (appendices T and U). Squid driftnet vessel owners, retiring their vessels in 1992, could receive $0.55-1.12 million, depending on vessel tonnage. Large-mesh driftnet vessel owners who retire their vessels in 1992 could receive compensation in the range of $500,000-870,000, depending on vessel tonnage.[9]

The Fisheries Agency of Japan announced in April 1993 that it would grant permission for exploratory squid jigging on the high-seas of the North Pacific between May 1 and December 31, 1993.[10] This trial fishery is being established primarily for those former driftnet fishermen who received government compensation only for the disposal of their driftnet gear. The jigging vessels will fish in the same area as the former Japanese driftnet fleet (from 20 to 47 degrees north latitude, from 170 east degrees longitude to 133 degrees west longitude) and will be equipped with satellite transponders. The FAJ expects approximately 20 vessels to participate in this fishery.

D. Distant-water Salmon Vessels

The history of the Japanese distant-water salmon fishery predates World War II when Japanese vessels caught salmon off the coasts of the former Soviet Union and the United States. The war caused the temporary cessation of the Japanese distant-water salmon fishery, but it resumed in 1952.[11] Japanese distant-water salmon vessels fished in U.S., Soviet, and high-seas waters under conditions set forth by the International North Pacific Fisheries Commission (INPFC) until the late 1980s when Japan stopped receiving salmon allocations from the United States. Japanese salmon vessels lost access to North Pacific high-seas fishing grounds in 1993 when this fishery was closed under the Convention for the Conservation of Anadramous Stocks in the North Pacific Ocean, the successor convention to the INPFC. Japanese distant-water salmon vessels currently have access to Russian-origin salmon in Japanese waters and salmon in the Russian EEZ (see Section VII - Access to Foreign Fishing Grounds). The two primary Japanese distant-water salmon fleets are the non-traditional land-based and traditional land-based fleets.

Non-traditional land-based: Vessels in this fleet were formerly called "motherships." These vessels were owned by large Japanese fishery companies and had a capacity of 7,000-12,000GRT each. They worked in conjunction with affiliated catcher vessels to can and freeze the salmon caught by the catcher vessels. With increasing international regulation of high-seas salmon fisheries, this fishery became less and less economically viable and was converted in 1990 to what is presently called the "non-traditional" land-based salmon fishery. It was given this name to differentiate it from the traditional land-based small/medium-sized salmon gillnet fishery.

Traditional land-based: The Japanese traditional land-based salmon fishery consists of small to medium-sized gillnet vessels having up to 127GRT. This fleet operates out of ports on the east coast of Hokkaido and northeastern Honshu. It uses gear similar to the non-traditional fleet, but when it conducted high-seas operations, it fished in an area south and west of the non-traditional fishery.[12]

With access to U.S. waters eliminated and allocations reduced in high-seas waters, the Japanese Government initiated a compensation program designed to encourage a large-scale reduction in the Japanese distant-water salmon fleet from 906 vessels in 1990 to 419 vessels by the end of 1992 (appendix V). The plan emphasizes reductions in the non-traditional and traditional land-based salmon fleets. The number of non-traditional land-based salmon vessels would be reduced from 129 vessels in 1990 to just 28 vessels in 1992, while the number of traditional land-based vessels would be reduced from 157 vessels in 1990 to just 60 vessels in 1992.

In mid-1992, the entire 88-vessel Hokkaido 19-ton class traditional land-based salmon fishing fleet was discovered fishing illegally on unauthorized high-seas grounds. The primary reason for the illegal fishing was that the quotas for Japanese vessels in Russian waters were not sufficient to profitably support fishing by the entire fleet. Consequently, the Japanese Pacific Salmon Fisheries Association has announced that 20 of the 88 vessels in this fleet will be eliminated in 1993. It is not clear whether the 20 vessels will be scrapped or converted for use in other non-salmon fisheries, but industry sources believe all 20 vessels will probably be scrapped. The Association plans to seek compensation from the Fisheries Agency of Japan and the Hokkaido Prefectural Government.[13]

E. Distant-water Tuna Vessels

The Japanese distant-water tuna fleet is the largest of Japan's distant-water fishing fleets. It is also the most valuable Japanese fishery with a total catch value of approximately $2.1 billion in 1990.[14] There are three types of Japanese distant-water tuna vessels: longline, pole-and-line, and purse seine. The Japanese longline and pole-and-line fleets have decreased gradually over the years as these fleets move to larger vessel sizes which are more profitable for distant-water operations (appendix W). The distant-water longliner fleet fishes all over the world, with small longliners concentrated in the Pacific and large longliners concentrated in the Atlantic and Indian Oceans (appendix X). The pole-and-line and purse seine fleets are concentrated in the central western Pacific Ocean.

Longliners: Japanese distant-water tuna longliners first began operations in the Indian Ocean during 1952. This fleet catches the majority of tuna (67 percent by quantity) within the entire Japanese longline tuna fleet. The distant-water longliner catch increased by 6 percent in quantity in 1991 compared to 1990 (appendix F). Longliners generally target bigeye, bluefin, and albacore tuna for the Japanese sashimi market. The number of Japanese tuna longliners has decreased gradually over the years, from 795 in 1985 to 759 in 1992 (appendix W). This trend is likely to continue as Japanese labor is scarce and increasingly expensive and this sector comes to be dominated by developing Asian competitors with cheap and abundant labor (e.g. China and Indonesia).

Pole-and-liners: The Japanese distant-water pole-and-line tuna fleet catches 53 percent of the entire (domestic and distant-water) Japanese pole-and-line tuna catch. Catch quantity increased by 31 percent in 1991 compared to 1990 (appendix F). Pole-and-line catch consists of skipjack and yellowfin tuna for the Japanese sashimi market. The number of Japanese pole-and-liners has decreased, however, falling from 155 in 1985 to just 81 in 1992 (appendix W).

Purse Seiners: The Japanese distant-water purse seine fleet is relatively new, beginning in the mid-1980s with 500GRT seiners operating in the western Indian Ocean.[15] These are "single-vessel" type seiners with a carrying capacity of 800 tons. Unlike the longliner and pole-and-line fleets, the Japanese distant-water purse seine fleet has grown steadily over the years, from 32 seiners in 1986 to 49 in 1992 (appendix W). In 1991, the Japanese distant-water purse seine vessels operated in the following areas: 32 in the central western Pacific, 11 in the Indian Ocean, and 2 in the Atlantic Ocean.[16] The distant-water purse seine fleet catch, almost all skipjack and yellowfin tuna sold to tuna canneries, totaled 170,000 t in 1991, a 6 percent increase over 1990 (appendix F).

With the concentration of distant-water purse seine effort in the central western Pacific, many Pacific Island nations have become concerned about possible

overfishing. In October 1992, eight members of the Forum Fisheries Agency (FFA) known as the "Nauru Group" (Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tuvalu) concluded an agreement which places a limit on the number of distant-water purse seine vessels fishing in the central and western Pacific. The vessels in this fishery mainly target skipjack and yellowfin tuna and account for most of the catch in the south Pacific region. The signatories justified the need for a limit by noting the rapid capitalization of this fishery and its possible detrimental effect on tuna stocks.[17] With access to central western Pacific fisheries becoming increasingly problematic, it is reasonable to assume that future Japanese distant-water purse seine effort will be increasingly devoted to Indian Ocean grounds.

1. Bluefin Tuna

Bluefin tuna is an important fisheries resource whose supply has been increasingly secured through distant-water fisheries. It is the most valuable tuna species on the lucrative Japanese sashimi market. There are three primary distant-water fishing grounds for this resource: the Northwestern Atlantic Ocean, the South Pacific, and the South Indian Ocean. Overfishing of bluefin tuna by global tuna fleets in the Atlantic Ocean led to the formation of the International Commission for the Conservation of Atlantic Tunas (ICCAT) which strictly limits the catch of the depleted Atlantic bluefin tuna resource.

Until 1993, catch of the South Pacific resource, known as southern bluefin tuna (SBT), was allocated among the three main participants in this fishery (Japan, Australia, and New Zealand) under a series of informal annual meetings. A formal convention for the conservation of the SBT resource was established in May 1993 to rebuild this depleted resource. The Japanese SBT fleet fishes in 7 main fishing grounds (appendix Y).

With access to tuna resources gradually becoming more difficult to secure, Japan has come to rely more and more on tuna imports. The rapid appreciation of the yen during the late 1980s and early 1990s has accelerated this trend. The distant-water tuna fleets of Taiwan, the ROK, China, Indonesia, and the so-called flag-of-convenience fleets (e.g. Honduras, Panama) are engaged in fierce competition for tuna exports to the lucrative Japanese market (see Section V. Fishing Vessel Exports for further discussion of this issue).

2. Labor Problems

Two problems facing the entire Japanese distant-water fishing fleet are especially acute for the distant-water tuna fleet. They are: 1) a shortage of fisheries labor, and 2) the aging of the fisheries work force. Japanese youth are not attracted to work perceived to be *kiken* (dangerous), *kitsui* (hard), and *kitanai* (dirty). The result is a workforce which is smaller in number and older in age (appendix Z).

One obvious solution to this problem, particularly for the distant-water tuna fleet, is hiring foreign labor from developing countries. In 1992, Japan's distant-water longliners employed 1,586 foreign laborers, distant-water pole-and-liners employed 101 foreign workers, and distant-water purse seiners employed 39 foreigners, bringing the total to nearly 2,000 workers. By country, these workers came from Indonesia (1,387), the Philippines (361), Peru (284), Kiribati (101), South Africa (44), Micronesia (30), Burma (5), Fiji (2), and Panama (1).[18]

The Japanese fisheries industry is attempting to reduce the need for domestic labor by automating fishing operations as much as possible (e.g. moving from two-vessel to one-vessel purse seine operations). Automation is expensive, however, so many vessel owners have gone into considerable debt to finance these improvements.

II. Government Promotion of Shipbuilding

The Japanese Government has five long-term, low-interest loan programs for the construction of new fishing vessels.[19] Two of these programs are for small fishing vessels having less than 110GRT and will not be described here. Details of the three programs promoting the construction of fishing vessels over 110 GRT are as follows:

The first program is called "Restructuring of Fisheries Corporate Management," and is administered by the Agriculture, Forestry, and Fisheries Finance Corporation. The program was established by the Fisheries Restructuring Special Measure Law of 1976

and provides low-interest loans (5.2 percent per annum in May 1993) to small and medium-class fishery companies having fewer than 300 employees and aggregate fishing vessel tonnage of less than 3,000 GRT. Construction of the following types of vessels are eligible for loans under this program: tuna longliners (up to 580GRT), skipjack pole-and-liners (up to 500GRT), purse seiners (up to 1,000GRT), medium-sized squid jiggers (up to 138GRT), offshore trawlers (up to 160 GRT), and East China Sea trawlers (up to 250GRT).

The second program is called the "Fishing Vessel Fund," and is also administered by the Agriculture, Forestry, and Fisheries Finance Corporation. This program provides low interest loans (4.8 percent per annum as of May 1993) to small and medium-class fishery companies not eligible under the first loan program described above. Construction of surimi and hokuten trawlers, and large squid jigging vessels are eligible for loans under this program.

The third program is called the "Distant-Water Fisheries Development Fund," and is administered by the Japan Development Bank. The fund provides low interest loans (4.7-5.1 percent per annum as of May 1993) amounting to 40-60 percent of the total cost of vessel construction to large fishery companies having more than 300 employees and aggregate fishing vessel tonnage greater than 3,000GRT.

III. Current Status of Shipbuilding

Despite the availability of low-interest government loans, an analysis of fisheries-related shipbuilding points to an industry in decline. Large shipyards which build not only fishing vessels, but also oil tankers and passenger/cargo vessels, have not been as hard hit by the reduced demand for fishing vessels. Smaller Japanese shipyards which primarily build fishing vessels, however, have been severely impacted.[20] The number of shipyards building fishing vessels has been halved during the 1980s, falling from 58 in 1980 to just 23 in 1991 (appendix AA). The corresponding number of vessels built decreased from 210 in 1980 to 97 in 1991. Only new tuna vessels and purse seiners are being constructed, with no new construction of trawler or salmon driftnet vessels (appendix BB).

The construction of new fishing vessels having less than 500GRT continued at a relatively steady pace until 1991, but the construction of vessels over 500 GRT has virtually stopped (appendix CC). The number of newly constructed fishing vessels decreased to successive all-time lows in fiscal years 1991/92 and 1992/93. A total of 278 vessels with a capacity of 16,045GRT was constructed in FY 1992/93, compared to 342 vessels (30,824GRT) built in FY 1991/92. Demand for new fishing vessels has been dampened by depressed fish prices, the increased cost of new vessels, and a shortage of fishing labor. With a continued bleak outlook for fiscal year 1993/94, fishing vessel builders are starting to explore conversion to other types of shipbuilding, such as the construction of coastal shipping vessels.[21]

A good example of the bleak situation facing the Japanese fishing vessel construction industry can be found in Nagasaki, where 70 percent of Japan's purse seine vessels were constructed until 1991. Only 12 purse seiners were licensed to be built in Nagasaki during 1991, and only 3 purse seiners were licensed in 1992. Nagasaki shipyards once built only purse seiners, but the depressed demand has forced them to focus their energies on alternative products, such as small cargo vessels and tankers for domestic and overseas routes.[22]

IV. Government Regulation of Fleet Size

The Japanese Government implements a licensing system (or limited-entry system) to control the size of the fishing fleet. Distant-water and offshore fishing vessels are licensed by the Ministry of Agriculture, Forestry, and Fisheries (MAFF). Coastal and inland fishing vessels are licensed by prefectural governors pursuant to authority delegated by the MAFF minister. This licensing system is considered a Government effort to decrease the Japanese fishing fleet size from its current level. When a distant-water fishing vessel is forced to retire because of reduced fishing allocations from foreign countries, it may not be relicensed for coastal fishing and must be scrapped.

Government subsidies are available under a special law for fisheries restructuring (Law Number 43-1976) for small-medium class companies (i.e. companies with fewer than 300 employees and aggregate vessel tonnage of less than 3,000GRT) which retire vessels

voluntarily. The subsidies are not only for the vessel owners but are also for crew members who need retraining for new jobs.

The Japanese Government provided buyback/ scrapping funding when Japanese fishing vessels were forced to retire because of reductions in foreign allocations until 1989. Compensation was paid to affected vessel owners using supplementary budget funds. On December 22, 1989, the Japanese cabinet approved a new compensation system called "Measures for International Fisheries Restructuring." This system was made available to vessel owners who are forced to retire their vessels because of more stringent foreign fishing regulations or quota reductions.

Under this program, affected vessel owners licensed by the MAFF can obtain compensation for expenses from the national government, and the cost of scrapping from the national and prefectural governments (two-thirds national/one-third prefectural). Vessel owners licensed by the prefectural government can obtain compensation for expenses from the national and prefectural governments (two-thirds national/one-third prefectural), and the cost of scrapping on a 50-50 basis from the national and prefectural governments.

There is also a "Provisional Measures Law for Fishermen Losing Jobs Due to International Agreements (Law Number 94-1977)." Affected fishermen can obtain benefits amounting to $1,300-1,400 per month for a maximum of two years from the Labor Ministry until they find new employment. This provisional law was scheduled to expire on June 30, 1993, but has been extended until June 1998.

V. Vessel Exports

As fishing has become less and less profitable for Japanese fishing companies, more and more fishing vessels have been exported to foreign countries. Since Japanese shipyards are building fewer new fishing vessels, the bulk of these exports are used fishing vessels. In 1980, Japan exported 35 new vessels (appendix DD), but by 1992 exported just 1 new vessel (appendix LL). In contrast, Japan exported 86 used fishing vessels in 1980, but by 1992 these exports nearly doubled to 153 used vessels.

Although many countries have purchased Japanese fishing vessels, the most significant customers have been China and the flag-of-convenience nations (appendix MM). Between 1985 and 1992, China purchased a total of 89 vessels, averaging 515GRT. A good number of these vessels are probably stern factory trawlers engaged in distant-water operations in the North Pacific and the eastern Atlantic Ocean off West Africa. Among the flag- of-convenience nations, Panama and Honduras purchased the lion's share of used Japanese vessels. Panama has purchased 103 vessels, averaging 354GRT, while Honduras purchased 65 vessels, averaging 307 gross registered tons. The vast majority of these vessels are believed to be distant-water tuna longliners, often owned by Taiwan companies.

The export of aging Japanese distant-water tuna vessels to flag-of-convenience states has become a source of great concern to the Japanese tuna industry. The primary reason for this concern is the fact that the majority of these vessels are thought to be tuna longliners which catch a considerable amount of sashimi-grade tuna that is exported to the Japanese market. These exports depress the potentially lucrative Japanese sashimi market by lowering tuna prices. The Japanese tuna industry estimates that approximately 200 reflagged tuna vessels are currently fishing, the majority of which are registered in Panama and Honduras (appendix NN). The Department of Defense data indicate that many former Japan-flag vessels are now flying foreign flags, the most notable of which are: Panama-58 vessels, Honduras-26 vessels, and St. Vincent-Grenadines-13 vessels (appendix OO).

The Japanese tuna industry estimates that Japanese imports of frozen sashimi tuna caught by these reflagged vessels increased from 27,000 t in 1989 to 39,000 t in 1991.[23] This amounts to 11 percent of total Japanese frozen sashimi tuna supplies, and 22 percent of frozen sashimi tuna imports. Since the traditional four suppliers of frozen tuna sashimi (Japan, the ROK, Taiwan, and Indonesia) provide 88 percent of the total supply, it is thought that the remaining supply consists almost entirely of flag-of-convenience vessel-caught product. The Japanese tuna industry speculates that the majority of the reflagged vessels are managed by ROK, Japanese, and Taiwan companies.

To combat this trend, the major Japanese tuna industry organization, NIKKATSUREN, has established a $9 million fund to compensate Japanese

tuna vessel owners who scrap rather than export their aging vessels. NIKKATSUREN is also addressing the questions of tuna oversupply and flag-of-convenience registration in bilateral private-level meetings with the ROK and Taiwan, and in quadripartite meetings with the ROK, Taiwan, and Indonesia.[24]

VI. Exploratory Fishing

The Japanese Government, established the Japan Marine Fishery Resources Research Center (JAMARC) in 1971 under the National Law for the Promotion of the Development of Marine Fishery Resources. JAMARC is a semi-governmental organization whose major objectives are: sponsoring exploratory fisheries by chartered vessels on the high-seas, joint research with coastal states within their 200-mile EEZs, and dissemination of research results to the Japanese industry.

During the past fiscal year, the Japanese Government increased the JAMARC budget from $36.9 million in FY1992 to $41.5 million in FY1993. The Japanese Government believes that since the development of unexploited marine fishery resources involves considerable economic risks, effective exploitation is only possible when it is promoted on a comprehensive basis with the full guidance and support of the Government.

JAMARC has the following research activities scheduled for the Japanese fiscal year 1993 (April 1, 1993-March 31, 1994)[25]:

Tuna Longlining: The 489GRT *Kaihatsu Maru* will conduct a survey for bigeye tuna on the highseas of the central southern Pacific.

Tuna Purse Seining: The research vessel *Nihon Maru* (769GRT) will conduct exploratory yellowfin tuna and skipjack fishing in the tropical Indian Ocean off the coasts of Madagascar and the Seychelles. In addition, it will explore grounds in the eastern Indian Ocean off Sumatra, Indonesia.

Another Japanese research vessel, the *Dai Hachi Tenno Maru* (349GRT), will explore the central western Pacific purse seine skipjack fishery. The vessel will concentrate its efforts on the relatively unexploited eastern portion of this fishery.

The *Hokusho Maru* (286GRT) will explore the skipjack, mackerel, and sardine resources in the central North Pacific, primarily in an area east of 160 degrees east longitude and north of 15 degrees north latitude.

Pole-and-Line: The *Dai 87 Kaio Maru* (499GRT) will conduct pole-and-line operations for skipjack and albacore tuna in the West Pacific in waters of the Tasman Sea between Australia and New Zealand.

Squid Jigging: The *Dai 2 Shinko Maru* (361GRT) will conduct exploratory jigging in two locations; the first is located in the southwest Atlantic off Argentina, and the second is located in the Ecuadorean EEZ.

Bottom Longlining: An unspecified research vessels will explore groundfish resources in the central North Pacific, beginning in January 1994.

Deepwater Trawling: The 3300GRT *Shinkai Maru* will conduct exploratory trawling off the coasts of Greenland, Norway, and the Faeroe Islands to determine the feasibility of an at-sea blue whiting surimi fishery.

VII. Access to Foreign Fishing Grounds[26]

Japan has a great number of government-to-government and private bilateral fishery arrangements with foreign countries. Japanese companies have often employed joint ventures to secure access to foreign fishery resources when direct access is constrained by stringent regulations. The total number of joint ventures by both number and type of fishery has remained remarkably stable over the years (appendix PP). The extent of Japan's private investment in foreign fishery enterprises is particularly extensive (appendices QQ-XX). Available information on individual countries is as follows:

A. Former Soviet Union/Russian Federation

Japanese and Soviet/Russian fishermen fish in each other's zone under an annual bilateral fisheries agreement. The 1993 Agreement provided non-fee quotas for both countries at 171,000 t, an 11,000 t decrease from 1992. An additional 18,000 t (down 12,000 t from 1992) was allocated to Japan for a $5.9 million cooperation fee, the same as in 1992. The Japanese negotiators reportedly requested that 1993 allocations remain the same as in 1992, but Russia was determined to significantly decrease Japanese allocations because of allegedly depleted Alaska pollock, cod, and flatfish stocks in the western North Pacific.[27]

Japanese **salmon** vessels fished in U.S., Soviet, and high-seas waters under conditions set forth under the International North Pacific Fisheries Convention (INPFC) until 1988. Since that time, the Japanese non-traditional fleet has lost its access to U.S. waters while the directed fishing for salmon on the high-seas has been banned as of 1993 under the Convention for the Conservation of Anadramous Stocks in the North Pacific Ocean, the successor convention to the INPFC. At present, Japanese salmon vessels only have access to Russian-origin salmon in Japanese waters, and salmon in the Russian EEZ.

Access and fees for Russian-origin salmon are negotiated annually. The 1993 Japan-Russia salmon agreement allows Japanese vessels access to 21,000 t of Russian-origin salmon in Russian waters and 4,819 t in Japanese waters. Although this allocation is a 2,000 t increase over the 1992 allocation, it is still not large enough to support the Japanese distant-water salmon fleet. Negotiations over the 1993 agreement were deadlocked for over a week when Russia insisted on Japanese compensation for damages incurred as a result of illegal high-seas salmon fishing by the 88-vessel small coastal salmon fleet. Japan argued that under international law, the flag nation has the right of enforcing and punishing for high-seas violations. Based on this principle, Japan has been imposing strict punishment on its fishermen and feels no obligation to pay compensation. No mention of compensation was made in the final agreement, but Japan agreed to provide Russia with an unspecified amount of additional money for the "reproduction of Russian salmon." This sum will reportedly be calculated by multiplying the total amount of illegally caught salmon by the fisheries cooperation fee of $1,200 per ton.[28]

With the dissolution of the Soviet Union in December 1991, there has been an increasing number of **joint ventures** with Russian companies. The number of Russia (former Soviet Union)-Japan fishery joint ventures doubled from just 7 in 1989 to 14 in 1991 (appendix QQ). These joint ventures are involved in a wide range of activities, from herring roe processing to crab pot fishing. Other joint ventures in Russian waters include joint fishing operations for Pacific cod and hair crab, purchases of Alaska pollock at sea from Russian fishing vessels, and joint seaweed and sea urchin harvesting off Kaigarajima Island (located 3.5 kilometers off the east coast of Hokkaido). The purchase of Alaska pollock at sea from Russian vessels has provided a significant supply for the Japanese market, annually ranging between 5,000 to 70,000 tons since 1987 (appendix RR). Japanese firms are also assisting Russian companies in salmon hatchery development.

Although Japanese companies are wary of Russian trustworthiness and product quality, Russian fishery resources are plentiful and available at comparatively cheap prices. It is evident that Japan will continue, and probably increase, its investment in Russian Far Eastern fisheries where fishery resources are still relatively cheap and abundant.

B. East Asia

China: Japan and China have not implemented 200-mile EEZs vis-a-vis each other. Bilateral fishery relations in the East China and Yellow Seas are conducted through the Japan-China Fisheries Agreement which went into effect on December 22, 1975. The Joint Fisheries Commission established under this agreement meets once a year to review conservation measures for fishery resources of common interest. As with the ROK, illegal fishing by Chinese fishermen in Japanese waters has been the primary matter of concern under this bilateral agreement.

Japanese investment in Chinese fishery companies began in 1985 with Taiyo's joint trawling venture with the Zhousan Joint Fisheries company (appendix SS). As of 1991, a total of four Japanese companies (Taiyo, Yamanaga, Yamato Kogyo, Niihama Shoji) are involved in trawling joint ventures in China. Other

joint ventures are involved in processing and mariculture.

Democratic People's Republic of Korea (DPRK): There is a private fisheries agreement between the DPRK and Japan which was concluded in September 1977. Under this framework, Japanese vessels are allowed to fish in DPRK waters. Japan received an allocation of 4,950 t in 1992, for a fee of $810,000. The allocation was divided into a squid jigging quota (4,500 t for a fee of $155 per ton) and a gillnet/longline quota (450 t for a fee of $250 per ton). The catch allocations increased 30 percent over 1991, but the fees remained unchanged. The fees will be used to finance the construction of a DPRK kelp processing plant.[29]

Republic of Korea: Japan and the ROK have not implemented 200-mile EEZs vis-a-vis each other. Bilateral fishery relations are conducted under the Japan-ROK Fisheries Agreement which was signed in December 1965. Throughout the course of this agreement, the primary bone of contention has been illegal ROK fishing in Japanese waters. ROK trawlers (many displaced from the donut hole fishery) have allegedly fished illegally off Hokkaido and western Honshu, prompting calls within the Japanese fishing industry for the declaration of a 200-mile EEZ with respect to the ROK.

Japanese companies have a great many investments in ROK firms (appendix SS), with the majority involved in eel and laminaria (*nori*) mariculture. Other joint ventures tend to be in fisheries processing.

C. South/Southeast Asia

Burma: The Japanese company Tokai Denbu announced plans to establish a surimi processing plant in Burma during 1991.[30] No further details are available.

India: Tokyo Suisan Company has established a surimi joint venture company in India with the Orient Highseas Fisheries Company of Hyderabad. This company operates a used Japanese stern trawler, the *Orient Angel*, refitted with surimi, fish meal, and fish fillet processing facilities. The vessel recently completed an exploratory fishing voyage and exported 60 t of surimi, 200 t of fishmeal, and 60 t of filleted fish to Japan.[31] The species being used are indigenous low-value species such as threadfin bream and hairtail.

The Japanese tuna industry has also secured access to the Indian tuna resource through the formation of a joint venture company. The joint venture was formed between Hoko Fisheries and the Bay Liners Ltd. company of Hyderabad, India. The company purchased one new Japanese 49-meter longliner and is reportedly engaged in exploratory fishing.[32]

Indonesia: There have been no direct Japanese fishery operations in Indonesia since 1984. The Japanese Government has sounded out Indonesian Government willingness to permit direct Japanese access to Indonesian waters, but Indonesia has thus far shown no willingness to grant access. It should be noted, however, that 27 Japanese tuna vessels, and 10 Japanese squid jiggers have been granted permission to operate in Indonesian waters during 1993 under charter to Indonesian companies.[33]

Japanese companies are involved in a great number of joint ventures in Indonesia (22 as of 1990), most of which are engaged in pearl culture and shrimp trawling (appendix TT). Other ventures are involved in processing and refrigeration. In 1993, a joint venture tuna canning company, Aneka Tuna Indonesia, was formed with financing by Itochu (47 percent), Placid (30 percent), Hagoromo Foods (13 percent), and the Japan International Cooperation Organization (10 percent). Tuna canned at the facility will be exported to the Middle East and Europe.[34]

Malaysia: The Sugiyo Company of Japan established a surimi processing joint venture firm, Sugiyo-Malaysia, with the Tekuskem Company of Malaysia in 1991. This was the third Japanese surimi plant in southeast Asia, following the Nissui plant in Thailand and the Kibun plant in Singapore.[35]

Philippines: Japan has not had access to Philippine fisheries since the Philippine EEZ was declared in 1979. Japan has sought talks to consider the access question, but no progress has been made. Japanese companies had investments in 6 Philippine fishery concerns as of 1990 (appendix UU).

Thailand: The first Japanese surimi joint venture in southeast Asia was formed in 1972 when Kibun established the Bangkok Frozen Food Co., Ltd.

Another Japanese firm, Tokai Denbu, announced its intention to establish a surimi plant in Thailand during 1991.[36] Other joint ventures in Thailand focus on processing and mariculture operations (appendix UU).

Vietnam: In 1992, Shinto Bussan announced its plans to begin surimi production in Vietnam.[37] This plant, and others like it in southeast Asia, processes local "trash" fish, such as threadfin bream, which are less expensive than Alaska pollock, the dominant surimi species caught in the North Pacific.

D. Oceania

Australia: Japanese tuna longliners fish in Australian waters under an agreement first signed in November 1979. During 1992/93, a maximum of 250 Japanese longliners could fish for tuna in the Australian EEZ for a fee of $2.8 million, a 3 percent decrease from the 1991-92 season. The Japanese quota for Southern Bluefin Tuna (SBT) in the Tasmania region will remain at 400 t, unchanged from 1991/92. In the tuna fishery off the Australian east coast, the number of Japanese longliners granted access to yellowfin and bigeye tuna remained at 50 vessels, unchanged from 1991-92. The number of Japanese longliners granted access to grounds off the Australian west coast, however, was reduced from 40 to 20 vessels.[38]

Japanese investment in Australian fisheries is limited to two areas, pearl culture and tuna longlining (appendix VV). Of major significance to this study is a joint venture company called Australia Japan Tuna Pty., Ltd., with Japanese capital from Nikkatsuren, the major Japanese tuna industry organization. This joint venture, formed in 1989, should allow continued Japanese access to the Australian tuna resource.

French Overseas Territories: A government-to-government agreement was initially reached between Japan and France in July 1979. The agreement allows Japanese tuna fishing in the waters off Polynesia, New Caledonia, and Wallis-Futuna. The 1991 agreement allowed 99 Japanese longliners to catch 5,000 t for a fee of ¥155 million off French Polynesia; 40 longliners and 12 pole-and-liners to catch 2,225 t for a fee of ¥47 million off New Caledonia; and 3 longliners and 3 pole-and-liners to catch 460 t for a fee of ¥8 million off Wallis and Futuna.[39]

Negotiations for the 1992 agreement broke off when the two sides could not reach agreement on the amount of access fees. Japan reported a sharp decrease in the tuna catch in French Overseas Territories' waters during 1991-92 because of the El Niño phenomenon. Consequently, Japan expected less industry interest in this fishing area and requested lower access fees. France, however, insisted on maintaining the same fee level as in 1991-92.[40]

There are two distant-water fishing joint ventures in New Caledonia. One of these companies, called Caledonie Kaiun S.A., was established in 1985 with investment from Matsuya and is engaged in tuna longlining (appendix VV). The other company, Societé Caledoiènnne des Pêches Industrielles, was formed in 1989 with investment from Nissui and is engaged in trawling operations.

Kiribati: There is a private agreement for tuna longliners and skipjack pole-and-liners which took effect in July 1978. During 1991, a total of 40 Japanese tuna vessels caught 3,000 t in Kiribati waters. Recent negotiations concerning extension of the agreement between the Japanese tuna industry and Kiribati ended with Kiribati declaring the agreement to be null and void as of August 3, 1993.[41]

The Marshall Islands: A government to government agreement was reached in April 1981 and fees are currently paid on a per vessel per trip basis. There is apparently one joint venture company called Nankatsu Corporation Inc. which was established in 1984 by Nanyo Shigen for skipjack fishing and processing in the Marshall Islands (appendix VV).

Federated States of Micronesia (FSM): Japan first gained access to the FSM tuna resource in January 1979 when a private agreement became effective. The original agreement was based on a lump-sum payment system where vessels paid a single fee to operate in the Micronesian EEZ during the agreed period. A per vessel per trip system was introduced in 1984, by which vessels pay an annual registration fee and permit fee each time they enter the Micronesian EEZ. Japan paid Micronesia nearly $31 million in access fees between 1979-90, accounting for over 75 percent of total FSM revenue obtained from access fees.[42]

A joint venture company has been established between the Okinawa Inshore Tuna Association and the

Micronesian Fisheries Corporation; it will allow small-scale Japanese tuna vessels (less than 20GRT) to fish in Micronesian waters. The vessels will be mostly based in Okinawa Prefecture ports, but vessels from other prefectures will be allowed to participate. The venture was scheduled to begin operations in March 1993 after purchasing a used airplane which will transport fresh tuna to the Japanese market. The venture is being watched closely by tuna industry observers as a new opportunity for the deployment of small-scale Japanese tuna vessels.[43]

Other joint ventures have been established between Taiyo Fisheries and the Chuuk State Government in 1990, and between the Japan Overseas Fisheries Company and Chuuk in 1991. Both joint ventures are currently inactive.[44]

New Zealand: Japanese trawlers, squid jiggers, and tuna longliners operate in New Zealand waters under a bilateral general access agreement which was reached in September 1978. A total of 40 Japanese tuna longliners, 32 trawlers, and 29 squid jiggers were permitted to fish in the New Zealand EEZ during the 1990/91 fishing season. Since the introduction of New Zealand's Quota Management System, however, only New Zealand companies and individuals may own fishing quota and foreign investment in New Zealand companies is limited to 24.9 percent. Quota holders may choose to use their own vessels or charter foreign vessels to catch their quota.

Under a charter arrangement, a foreign vessel is hired to catch a quantity of fish which a New Zealand company owns. Charter foreign fishing vessels catch approximately 60 percent of the entire catch in the New Zealand EEZ. An estimated 100 foreign fishing vessels will be hired under charter arrangements in the 1992/93 fishing year. These vessels come from many countries, including Japan. New Zealand companies have benefitted greatly from the use of foreign chartered vessels because of the lower catching costs for these vessels. The chartered vessel catch is composed largely of groundfish species, such as hoki and southern blue whiting, and squid.[45]

Japanese **trawlers** have targeted squid, jack mackerel, barracuda, and hoki in New Zealand waters since 1959. The majority of the total Japanese southern trawler catch was taken in waters off New Zealand between 1988-90 (appendix L). Catch in New Zealand decreased slightly over this three-year period while fleet deployment stabilized at 32-33 trawlers.

New Zealand has traditionally been Japan's leading southern trawler fishery, but the imposition of a New Zealand EEZ brought with it greatly reduced allocations and catch. As in other parts of the world, Japanese allocations have been gradually phased out as more of the most valuable fishery resources have been allocated to domestic fishermen. Japan has received no quota since 1991, and has been obliged to form joint ventures or operate on a charter basis with New Zealand fishing companies. Many joint ventures have been formed to fish hoki, a groundfish species used in surimi production. Hoki is the most important target species for Japanese southern trawlers fishing in New Zealand, usually comprising two-thirds of the total catch (appendix M).

With the nationalization of the New Zealand fishery as an impetus, Japanese companies have formed 5 trawling joint ventures. Taiyo has formed 2 joint ventures while the smaller Kanai Gyogyo has formed 3 joint ventures. All of these ventures were formed between 1985-90 (appendix WW).

Japanese squid **jiggers** conducted initial exploratory fishing off New Zealand during 1970. Thanks to poor domestic catch and the fact that the New Zealand squid season was opposite that in Japan, over 100 Japanese jiggers flocked to this fishery by the mid-1970s. Since New Zealand's declaration of a 200-mile EEZ in 1988, however, Japanese allocations and catch have decreased drastically. From a peak of 138 vessels catching 50,000 t in 1988/89, only 8,500 t was caught by 29 jiggers in the 1990/91 season (appendix N). The decline in effort continues as 8 Japanese jiggers caught just 3,800 t of squid in the 1992/93 season, compared to 6,100 t in 1991/92.[46] Japan no longer receives direct allocations under New Zealand's ITQ management system, but rather forms *pro forma* joint ventures through which Japanese firms can receive Individual Transferable Quota (ITQ) allocations.

Two squid jigging joint ventures have been formed in New Zealand (appendix WW). The Nichimo company of Japan formed a squid jigging joint venture in 1973 called Jaybel Nichimo Fishing Ltd., and another venture called Allied Fisheries N.Z. Ltd. was formed with the Toshoku Takara Gyogyo in 1979.

Bilateral talks concerning Japanese **tuna** fishing in the New Zealand EEZ concluded without agreement in Tokyo in January 1993. In December 1992, New Zealand informed Japan of its proposed regulations for Japanese fishing during the 1992/93 season. During the January 1993 meeting, Japan requested less stringent terms regarding fishing zones, vessel numbers, fees, and observers, but New Zealand promised only to review its terms.[47]

The New Zealand Government reports, however, that 17 Japanese longline vessels will be permitted to target Southern Bluefin Tuna in the southern tuna fishery during the 1992/93 fishing season. A total of 9 Japanese longliners will be permitted to target albacore and yellowfin tuna in New Zealand's northern tuna fishery.[48]

As it did in Australia, Nikkatsuren has formed a joint venture company to ensure continued access to New Zealand tuna stocks (appendix VV). The company is called New Zealand Japan Tuna Co. Ltd., and was formed in 1989.

Palau: A private tuna fishing agreement was first concluded in January 1979. Japan has paid fees using a lump-sum system although it has proposed changing this to a "per vessel per trip" system. Disputes over this issue have caused several interruptions in this agreement. A new agreement reached in September 1991 provides for annual and per trip vessel permits. A total of 33 purse seiners and 65 longliners have applied for permits and will pay a $650,000 access fee ($500,000 under the previous agreement).[49]

The private venture, Palau International Traders Inc., reportedly has Japanese and Micronesian ownership, in partnership with Palauans. The firm operates 54 tuna longliners, most of which are registered in China and Taiwan.[50]

Papua New Guinea: Japan and the PNG signed a private fisheries agreement in 1978, but the agreement was terminated in 1987 when the two sides could not agree on fishing fees. Hosui and Nissui formed a shrimp trawling joint venture in 1972 called New Guinea Marine Product Pty., Ltd. which is engaged in shrimp trawling (appendix VV).

The Solomon Islands: Japanese involvement in the Solomon Islands began in 1971 when Taiyo conducted an exploratory tuna fishery. Taiyo soon after formed a joint venture tuna fishing and processing company called Solomon Taiyo Ltd.(STL) (appendix VV). The company was launched with 75 percent Japanese and 25 percent Solomon Islands ownership. STL currently operates 20 pole-and-line vessels, 12 of which are chartered from Okinawa Prefecture. In addition, STL operates 3 group purse seiners and one single purse seiner. Most of the catch is skipjack which is landed and canned at local ports.[51]

Tuvalu: Japan has both a government-to-government general access and a private agreement with Tuvalu which took effect in June 1986. The agreement reportedly expired in June 1991.

E. Africa/Middle East

Coastal Africa was formerly the most important fishery for the Japanese southern trawler fleet. The fleet targeted octopus, squid, and snapper in grounds off the coasts of Mauritania and Morocco until it withdrew in 1982. In addition, the trawler fleet targeted fish in Angolan waters until Angola's declaration of an EEZ in 1975. Present Japanese fishing activity focuses on exploiting African tuna resources. Japanese firms have been involved in a limited number of joint ventures in this region (appendix WW).

The Gambia: Japan reached a private-level agreement with the Gambia in July 1992. The agreement allows 40 Japanese longliners and 2 purse seiners access to the Gambian EEZ for one year with automatic extensions. Longliners pay a fee of $1,000 per vessel for 3 months of fishing, and $350 per month for a one-month extension. Purse seiners pay a fee of $5,000 per vessel for 5 months of fishing.[52]

Mauritania: The 1991 Japan-Mauritania fisheries agreement allows 30 Japanese longliners access for an access fee of $3,600 per longliner for 3 months, with an option for a one-month extension for $1,200 per vessel.[53] The terms of the 1992 agreement (effective July 30, 1992-July 29, 1993) call for increased access fees of $3,900 per longliner for 3 months, with an option for a one-month extension for $1,300 per vessel. A total of 30 Japanese longliners will be permitted to fish in Mauritanian waters.[54]

Morocco: Morocco and Japan have annually renewed a bilateral fishing agreement since 1985. The most recent renewal, completed in mid-1993, allows up to 30 Japanese longliners to catch tuna, primarily bluefin, in Moroccan waters. Japan will pay $5,500 per vessel for three months of fishing, a slight decrease from the 1992 fee of $6,500.[55]

Oman: A fisheries aid agreement was signed with Oman in May 1993.[56] Japan will provide Oman with a 16-meter fisheries research vessel, send five Japanese fishery experts to the Oman Ministry of Agriculture and Fisheries, and train 15 Omanis in Japan. The aid package will be carried out over five years and was budgeted at $10 million. It is unclear whether Japanese access to Omani tuna and demersal resources are a part of this agreement.

Senegal: Japan and Senegal concluded a fisheries agreement on October 14, 1991. The agreement allowed Japanese tuna vessels access to Senegalese waters for the first time since Senegal declared a 200-mile EEZ in 1976. The agreement will allow 40 Japanese longliners access in exchange for a fee of $1,500 per vessel per month. In addition, 2 Japanese purse seiners will be granted access for an advance fee of nearly $1,400 per vessel.[57]

Seychelles: Japanese longliners are licensed to fish for tuna in Seychelles waters. Japan has refused to sign a fishery agreement with the Seychelles because its vessels fish there only a few months of the year. The number of Japanese longliners licensed in the Seychelles decreased from 40 in 1988 to 19 in 1990.[58]

Sierra Leone: The Japan-Sierra Leone fisheries agreement gives Japanese tuna longliners and purse seiners access to the Sierra Leone EEZ. The agreement reached in November 1990 imposes an access fee of $2,400 per longliner for 3 months of fishing with a possible one-month extension for a fee of $800 per longliner. Purse seiners must pay $5,000 per vessel for 3 months, with a possible one-month extension for a fee of $1,700 per seiner. A total of 20 longliners and 2 purse seiners are allowed access under the agreement.[59]

South Africa: In recent years, South Africa has been the only coastal African country which has allowed Japanese trawling in its waters. Japanese trawlers and longliners have operated in South Africa under a government-to-government agreement which was concluded in December 1977. Japan received allocations of approximately 33,000 t from South Africa until 1986 when concerns over stocks and a desire to "South Africanize" the jack mackerel fishery led to gradually reduced allocations (appendix K). A total of 5 Japanese trawlers caught approximately 11,000 t of fish in South African waters in 1990 (appendices J and L). The South African Government has announced a total phase-out of foreign allocations by 1993. This would mean the elimination of Japanese trawlers from African coastal fisheries.

F. Europe

Portugal: Japanese tuna longliners secured access to tuna in the Portuguese EEZ off the Madeira Islands under an agreement reached in 1980. The agreement became void in 1986 when Portugal became a member of the European Community (EC). Since that time, Japanese longliners have secured access through licenses issued by the EC. During 1990, 10 Japanese longliners were permitted to catch 80 t of bluefin tuna.

G. Latin America

Argentina: Argentina allowed Japanese trawlers access in 1978-79, but limited access to joint venture operations from 1980-87. In 1988-89, a total of 3 Japanese trawlers were granted access to Argentine waters to conduct exploratory groundfish surimi operations. The major Japanese fisheries company, Nissui, is involved in two joint venture trawling operations, and the smaller companies (Sakyu Shoten, Kaiyo Gyogyo, and Kyosui) are also conducting joint venture trawling operations (appendix XX). The Japanese firm, S.A. Marine, began a squid jigging venture in Argentina during 1988. As it did in Chile, the Tokai Denbu Company announced plans to begin surimi production in Argentina in 1991.[60] Another major Japanese fisheries company, Nichiro, has a joint venture with the Pionera company of Buenos Aires which catches sea bream and shrimp using two former Japanese trawlers.[61]

Argentina has recently revised its fishing vessel chartering regulations, permitting foreign vessels to fish in the Argentine EEZ. This has allowed Japanese squid jiggers to fish in Argentine waters instead of the Falkland Islands. Japanese jiggers caught 81,000 t of squid in Argentine waters during the 1992/93 season.[62]

Brazil: Three Japanese jiggers are reportedly conducting exploratory fishing off the coast of Brazil. No further details are available.[63]

Chile: Surimi processing joint ventures in Latin America have taken place largely in Chile and Argentina. The primary species used are groundfish such as jack mackerel and hake. In addition to its operations in Southeast Asia, Tokai Denbu announced plans to set up surimi production in Chile in 1991.[64] Mitsui Corporation established a surimi joint venture company with the E.L. Golfo Company of Chile and hoped to produce 5,000 t of surimi per year for export to Japan.[65] The giant Japanese fishery companies, Kyokuyo and Nissui, began joint venture surimi trawling operations in 1991.[66] Another of Japan's major fishery companies, Nichiro, has established a surimi joint venture in Chile with the Alimentos Marinos Company. This joint venture hopes to produce 4,000 t of jack mackerel surimi annually for the Japanese market.[67] Taiyo and Nissui have also invested in Chilean trawling operations, and New Nippo has invested in Chilean longlining operations (appendix XX).

Falkland Islands: Japanese companies have deployed both squid jiggers and trawlers off the Falklands. Fishing effort was negligible in this region until the mid-1980s. Several Japanese companies and associations have deployed vessels, often under nominal charter to British-Falklands joint ventures. In 1993, Japanese companies sharply reduced their effort off the Falklands and unconfirmed reports suggest Japanese companies opted to deploy 32 vessels off Argentina under the terms of new Argentine chartering regulations.[68]

Japanese jiggers started catching squid off the Falkland Islands in 1985. Thanks to ample squid stocks and a lack of fishing restrictions, effort grew dramatically to a peak of 110 vessels catching nearly 200,000 t in 1987/88. Oversupply on the Japanese market and subsequent industry policy to reduce catch resulted in lower effort in succeeding years, but 82 vessels still caught 110,000 t in 1990/91. The large-scale reduction in deployment noted above is confirmed by a report that a total of 33 Japanese jiggers caught 28,000 t of squid in the Falkland Islands EEZ in the 1992/93 season, a big decrease from the 76,000 t caught in this fishery during 1991/92.[69]

Mexico: The Japan Large Squid-Jigging Vessel Association has been conducting exploratory jigging operations off the coast of Mexico. The Association reportedly sent 6 vessels to the area in 1992.[70]

Peru: During the past few years, an increasing amount of interest has been shown in the potential for a jigging fishery within the Peru EEZ. A total of 30 Japanese squid jigging vessels have secured access to 67,234 t of squid in Peruvian waters in 1993 for a fee of $160 per ton. Although the 1993 access fee is one-third higher than the 1992 fee, Japanese industry sources are optimistic that jigging operations will be profitable because of the recent appreciation of the yen and increased demand for Peruvian squid by Japanese squid processors.[71] The latest Japanese press reports indicate that there are 22 Japanese jiggers deployed in Peruvian waters which have caught 9,000 t during the still-continuing 1992/93 season. Japanese catch in Peru has increased dramatically and reached 41,600 t in 1991/92.[72]

Suriname: Japanese shrimp trawling in Suriname is conducted via the joint venture company, Suriname Japan Fisheries Ltd. (SUJAFI) (appendix XX). SUJAFI operates a total of 54 foreign-owned vessels: 45 Japanese, and 9 ROK vessels. Most of the shrimp is exported to Japan, with some exported to France. The total number of Japanese trawlers licensed to fish in Suriname waters has remained fairly constant, ranging from 36 trawlers in 1987 to 34 trawlers in 1992. The total 1991 catch by Japanese shrimp trawlers in Suriname is estimated at 1,000 tons.[73]

H. North America

Canada: Japan receives allocations only in the Atlantic waters of Canada. There have been no Japanese allocations in Canadian waters of the Pacific Ocean since 1983. Japanese southern trawlers have fished extensively off Atlantic Canada. The primary target species was formerly squid, but recent poor catches have resulted in a shift of effort to Greenland halibut and redfish. Japan's catch allocations in Canadian waters have decreased gradually over the years, from 40,000 t in 1987 to 34,000 t in 1991 (appendix K).

There are only 2 Japanese fisheries-related investments in Canada: North Sea Products Ltd. and Tohto Suisan (B.C.) Ltd. The former has investment

capital from the Kibun Company and is involved in fisheries processing, while the latter has capital from Tohto Suisan and is also involved in fisheries processing (appendix WW).

United States: Although Japanese vessels no longer fish in U.S. waters, Japanese companies still have a wide range of investments in the U.S. fisheries industry (appendix YY). The majority of these investments is in the North Pacific Alaska pollock/surimi, salmon, and crab fisheries.

VIII. Aid to Developing Coastal Countries

The Japanese Government provides fishery materials and technical assistance to promote economic development in, and maintain friendly relations with, recipient countries.[74] Overseas fisheries aid is provided in the form of grants and loans (governmental), and Overseas Fishery Cooperation Foundation (OFCF) (non-profit organization) projects.

A survey of OFCF projects in 1991 and 1992 indicates the vital role aid plays in securing access to promising distant-water fishing grounds. During those two years, the OFCF initiated projects in the following countries: Micronesia, Mauritius, the Solomon Islands, Kiribati, Mexico, the Marshall Islands, the Russian Federation, Australia, Morocco, and Palau.[75]

IX. Outlook

With the exception of tuna longlining, the scale of Japanese distant-water fishing operations has decreased significantly in the past few years. Japan has received no U.S. allocations since 1989; high-seas salmon fishing was banned as of 1992; high-seas pelagic driftnetting was terminated at the end of 1992; the donut hole is closed to fishing. The day when all Japanese distant-water fishing operations become unprofitable may soon be at hand, if it is not here already (appendix ZZ). Consequently, it may not be an overstatement to suggest that someday there may be no direct Japanese involvement in distant-water catch operations, simply because it is no longer possible to compete with less-developed Asian rivals which have cheap and abundant labor. The inexorable trend toward value-added operations and away from catch operations should continue for the foreseeable future.

A. Trawlers

The outlook is especially bleak for Japanese distant-water trawlers. The fleet has shrunk dramatically since 1990, and should continue to shrink in the future. It would not be surprising if the North Pacific and converted trawler fleets were phased out by the year 2000, with a limited amount of continued hokuten, southern, and shrimp trawling. This distant-water trawling fishery is simply too unprofitable for Japanese fishing companies to continue much longer. The most probable scenario, which can already be observed, is one where Japanese companies sell their factory trawlers to foreign joint venture partners in developing countries. Under this arrangement, Japanese fishery companies offer technical expertise in exchange for access to the final product which is exported to Japan.

B. Squid Jiggers

Japanese squid jigger effort should continue to shift from traditional grounds off New Zealand and the Falkland Islands to new grounds off Argentina and Peru. If exploratory jigging off Brazil and Ecuador is successful, a good number of Japanese vessels will probably flock to these new fisheries. The size of the fleet should continue to slowly decrease as increased access fees and operation costs make distant-water jigging increasingly unprofitable.

C. Driftnet Vessels

In the wake of the U.N. moratorium on high-seas pelagic driftnet fishing, there are few viable alternatives for the vessels in this fleet. Exploratory squid jigging on the high-seas of the north Pacific has thus far been unsuccessful, and it is doubtful whether it would be profitable for former driftnet vessels to move into other distant-water tuna or squid jigging fisheries. The most plausible scenario is that many driftnet vessel owners will seek Government compensation and sell their vessels for scrap or export to developing countries.

D. Distant-water Salmon Vessels

The future for this fleet is bleak. The fleet is composed largely of older vessels trying to catch an increasingly limited amount of fish. This fishery could be phased out by the turn of the century.

E. Distant-water Tuna Vessels

Thanks to the high market value of sashimi-grade tuna, this is one sector where the Japanese distant-water fleet has been able to operate in the black, but this situation may change. Oversupply of sashimi-grade tuna on the Japanese market, combined with rising fuel and labor costs, may well make it impossible for Japanese fishery companies to conduct profitable catch operations in this fishery. Japanese companies will continue to provide capital and expertise, but the actual fishing will be done increasingly by fleets in developing countries (e.g. China and Indonesia) with much lower operating costs. This is particularly true for the longline and pole-and-line fleets which specialize in tuna for the sashimi market and are highly labor-intensive.

The Japanese purse seine fleet in the central Pacific may continue to show slow growth, but this fleet faces the same constraints as its longliner and pole-and-line compatriots, so an extensive expansion of Japanese purse seine effort is unlikely. If limits are placed on the number of seiners permitted to operate in the central western Pacific fishery, many Japanese purse seiners will probably shift their efforts on Indian Ocean skipjack and yellowfin fisheries.

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Endnotes

1. The bulk of background information describing the Japanese distant-water fleets is taken from the annual Japanese fisheries yearbook, *Suisan Nenkan*.

2. U.S. Embassy, Tokyo, August 4, 1993.

3. It is unclear whether the final destination for the *Takachiho Maru* was Somalia or Honduras.

4. U.S. Embassy Tokyo, November 22, 1991.

5. The author is unable to explain the discrepancy between the total number of Japanese southern trawlers noted in appendices D and J.

6. U.S. Embassy, Tokyo, August 4, 1993.

7. *Nikkan Suisan Keizai Shinbun*, July 20, 1993.

8. *Nikkan Suisan Keizai Shinbun*, September 4, 1992.

9. U.S. Embassy Tokyo, October 19, 1992.

10. *Nikkan Suisan Keizai Shinbun*, April 27, 1993.

11. "Research related to the Japanese mothership salmon fishery and the International North Pacific Fisheries Commission," NOAA/NMFS Northwest Fisheries Science Center Monthly Report, January 1972, p. 2.

12. Michael L. Dahlberg, "The High Seas Salmon Fisheries of Japan, 1990," National Marine Fisheries Service-Alaska Fisheries Science Center, September 27, 1990, p. 2.

13. *Nikkan Suisan Keizai Shinbun*, March 4, 1993.

14. This figure includes all coastal and distant-water fisheries.

15. Asian Development Bank/Infofish, *Global Industry Update: Tuna*, 1991, p. 52.

16. U.S. Embassy Tokyo, April 14, 1992.

17. *Forum Fisheries Agency News Digest*, No. 6, November-December 1992, p. 1.

18. *Katsuo-Maguro Tsushin*, No. 6525, May 6, 1992, as printed in *Forum Fisheries Agency News Digest*, No. 4, July-August 1992, p. 23.

19. The source for information on Japanese Government promotion of shipbuilding comes from, "The Journal of the Fishing Vessel Association of Japan", Nos. 294 and 300.

20. U.S. Embassy, Tokyo, May 28, 1993.

21. *Nikkan Suisan Keizai Shinbun*, April 9, 1993.

22. *Nikkan Suisan Keizai Shinbun*, June 18, 1992.

23. Statistics regarding the flag of convenience tuna fleet come from *Suisan Shuho*, February 15, 1993, pp. 6-7.

24. The introduction of a significant Indonesian tuna longlining fleet is a comparatively recent phenomenon. The Indonesia Tuna Association, comprised of 12 Indonesian companies operating 50 longliners, was created in February 1992, and soon after became the fourth member of the private-level sashimi tuna suppliers talks. *Katsuo-Maguro Tsushin*, No. 6523, April 30, 1992, as printed in *Forum Fisheries Newsletter.*, No. 4, July-August 1992, p. 22.

25. JAMARC activities are translated from *Suisan Shuho*, February 5, 1993, pp. 16-17, and July 15, 1993, pp. 24-25.

26. Unless otherwise noted, information on Japanese bilateral fishery relations is taken from: U.S. Embassy, Tokyo, "Report on the Japanese Fishing Industry in 1990," September 10, 1992.

27. U.S. Embassy, Tokyo, December 22, 1992.

28. *Nikkan Suisan Keizai Shinbun*, March 25, 1993.

29. *Nikkan Suisan Keizai Shinbun*, December 25, 1991.

30. *Nikkan Suisan Keizai Shinbun*, September 17, 1991.

31. U.S. Consulate, Madras, July 2, 1993.

32. U.S. Consulate, Madras, July 2, 1993.

33. *Nikkan Suisan Keizai Shinbun*, June 2, 1993.

34. *Nikkan Suisan Keizai Shinbun*, June 25, 1993.

35. *Nikkan Suisan Keizai Shinbun*, August 9, 1991.

36. *Nikkan Suisan Keizai Shinbun*, September 17, 1991.

37. *Nikkan Suisan Keizai Shinbun,* July 31, 1992.

38. *Nikkan Suisan Keizai Shinbun*, November 25, 1992.

39. *Katsuo-Maguro Tsushin*, No. 6310, June 12, 1991, as printed in *Forum Fisheries Agency News Digest*, No. 5, September-October 1991, p. 4.

40. *Katsuo-Maguro Tsushin*, No. 6538, May 25, 1992.

41. *Nikkan Suisan Keizai Shinbun*, April 7, 1993.

42. J.H. Diplock, "Tuna Fisheries in the Federated States of Micronesia," *Marine Fisheries Review*, 55 (1), 1993, pp. 3-5.

43. *Nikkan Suisan Keizai Shinbun*, December 1, 1992.

44. National Marine Fisheries Service, "Federated States of Micronesia Fisheries," *International Fisheries Reports*, IFR 92/76, October 2, 1992.

45. New Zealand Ministry of Agriculture and Fisheries, 5 July 1993.

46. *Nikkan Suisan Keizai Shinbun*, July 20, 1993.

47. *Nikkan Suisan Keizai Shinbun*, January 28, 1993.

48. New Zealand Ministry of Agriculture and Fisheries, *op. cit.*

49. *Nikkan Suisan Keizai Shinbun*, September 27, 1991; *Forum Fisheries Agency News Digest.*, No. 1, January-February 1992, p. 1.

50. U.S. Office, Koror, August 3, 1993.

51. *ADB/Infofish Fishery Export Industry Profile: Solomon Islands*, 1992, pp. 14-15.

52. *Suisan Tsushin*, August 4, 1992.

53. *Katsuo-Maguro Tsushin*, No. 6350, August 6, 1991, as printed in *Forum Fisheries Agency News Digest* , No. 5, September-October 1991, p. 5.

54. *Katsuo-Maguro Tsushin*, No. 6583, July 27, 1992, as printed in *Forum Fisheries Agency News Digest*, No. 5, September-October 1992, p. 4.

55. U.S. Embassy, Rabat, July 1, 1993, *Infofish Trade News.*, 15 July 1993.

56. U.S. Embassy, Muscat, June 20, 1993.

57. *Nikkan Suisan Keizai Shinbun*, October 17, 1991.

58. National Marine Fisheries Service, "The Fisheries of Seychelles," *International Fishery Reports*, IFR 89/96, December 8, 1989; Seychelles Fishing Authority, *Tuna Bulletin-Second Quarter 1991*, p. 14.

59. *Katsuo-Maguro Tsushin*, No. 6169, November 5, 1990, as printed in *Forum Fisheries Agency News Digest*, No. 2, March-April 1991, p. 3.

60. *Nikkan Suisan Keizai Shinbun*, September 17, 1991.

61. *Nikkan Suisan Keizai Shinbun*, July 19, 1993.

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63. *Nikkan Suisan Keizai Shinbun*, July 20, 1993.

64. *Nikkan Suisan Keizai Shinbun*, September 17, 1991.

65. *Nikkan Suisan Keizai Shinbun*, August 22, 1991.

66. *Nikkan Suisan Keizai Shinbun*, February 18, 1992.

67. *Nikkan Suisan Keizai Shinbun*, June 15, 1992.

68. *Fishing News International,* June 1993.

69. *Nikkan Suisan Keizai Shinbun*, July 20, 1993.

70. *Nikkan Suisan Keizai Shinbun*, December 19, 1991.

71. *Nikkan Suisan Keizai Shinbun*, April 13, 1993.

72. *Nikkan Suisan Keizai Shinbun*, July 20, 1993.

73. U.S. Embassy, Paramaribo, June 30, 1993.

74. For a more detailed account, see "Japanese Overseas Fisheries Aid, 1990," NMFS Office of International Affairs, *International Fisheries Report* 91/34, May 6,1991.

75. *Suisan Shuho*, June 5, 1993, pp. 24-25.

Appendices

Appendix A.-- Japan. Number of fishing vessels, ranked by gross registered tonnage, 1975-92.

Year	Gross Registered Tons (GRT)			Total
	500-999	1,000-1,999	Over 2,000	
	Number of vessels			
1975	65	51	56	172
1976	65	47	56	168
1977	55	46	55	156
1978	46	41	52	139
1979	39	36	49	124
1980	36	31	45	112
1981	32	32	42	106
1982	20	33	40	93
1983	17	34	39	90
1984	21	34	41	96
1985	45	30	41	116
1986	95	28	42	156
1987	110	32	42	184
1988	138	40	42	220
1989	119	31	39	189
1990	20	18	37	75
1991	15	16	32	63
1992	9	14	23	46

Source: *Lloyd's Register of Shipping Statistical Tables,* London, UK, various years.

Appendix B. -- Japan. Number of fishing vessels having more than 100 gross registered tons, 1980, 1985-91.

Vessel Type	1980	1985	1986	1987	1988	1989	1990	1991
Number of vessels								
Trawlers	429	340	315	255	247	235	230	215
East China Sea Trawlers	253	175	331	326	316	304	243	235
Longliners	101	101	88	105	112	109	118	120
Driftnetters	84	250	310	348	402	399	393	299
Purse Seiners	158	174	180	195	180	175	172	166
Pole and Liners	239	155	146	156	245	307	281	250
Tuna Vessels	1,120	928	932	941	935	951	981	973
Fish Carriers	198	235	225	232	226	229	188	142
Refrigerated Transports	15	10	12	10	8	5	4	2
Whaling Vessels	17	13	13	15	6	5	0	0
Other*	607	706	670	668	668	670	659	646
Total	3,454	3,272	3,222	3,251	3,345	3,389	3,269	3,048

Source: Fisheries Agency of Japan, *Statistical Tables of Fishing Vessels,* 1980-91.
* - Other includes vessels ancillary to purse seine operations, and governmental or prefectural research, training, and enforcement vessels.

Appendix C. -- Japan. Number of fishing vessels having more than 100 gross registered tons, 1980, 1985-91.

Capacity Class	1980	1985	1986	1987	1988	1989	1990	1991
Number of vessels								
100-200GRT	1,450	1,381	1,366	1,345	1,479	1,534	1,441	1,289
200-500GRT	1,758	1,652	1,612	1,658	1,646	1,659	1,654	1,639
500-1,000GRT	71	57	58	61	54	52	47	35
1,000-2,000GRT	59	48	52	55	51	49	45	32
2,000-5,000GRT	92	99	98	91	85	72	60	39
5,000-10,000GRT	19	30	30	35	25	21	20	14
Over 10,000GRT	5	5	6	6	5	2	2	0
Total	3,454	3,272	3,222	3,251	3,345	3,389	3,269	3,048

Source: Fisheries Agency of Japan, *Statistical Tables of Fishing Vessels,* 1980-91.

Appendix D. -- Japan. Number of licensed fishing vessels for designated distant-water fisheries, 1980, 1985-91.

Type of Fishery	1980	1985	1986	1987	1988	1989	1990	1991
				Number of Vessels				
Trawlers								
Northern Trawlers	40	29	28	30	33	33	31	12
Converted Trawlers	16	14	11	11	12	13	13	11
Hokuten Trawlers	97	54	54	54	54	54	54	47
Southern Trawlers	79	54	62	64	67	52	49	33
E. China Trawlers	213	171	151	156	148	144	133	112
Total Trawlers	445	322	306	315	314	296	280	215
Driftnet-Squid	-	422	445	440	428	451	359	276
Squid Jigging*	224	174	145	151	269	324	133	113
Distant-water tuna Vessels								
Longliner	883	823	818	819	807	806	791	790
Pole-and-line	240	129	120	115	97	94	88	82
Purse Seine	-	35	38	34	39	37	35	45
Total Distant-water Tuna Vessels	1,123	987	976	968	943	937	914	917
Total Vessels	1,792	1,905	1,872	1,874	1,954	2,008	1,686	1,521

* - Japanese squid jigging vessel statistics did not distinguish between coastal and distant-water squid jiggers until 1990.
Source: *Gyogyo Yoshoku Seisan Tokei Nenpo,* Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries.

Appendix E. -- Japan. Total fisheries catch, by type of fishery, 1980, 1985-91.

Type of Fishery	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Marine Fisheries								
Distant-water	2,167,200	2,111,300	2,335,700	2,344,300	2,247,400	1,976,200	1,496,400	1,179,000
Coastal	5,704,700	6,497,600	6,792,400	6,634,400	6,896,800	6,340,400	6,081,100	5,438,100
Off-shore	2,036,700	2,268,000	2,212,600	2,150,700	2,115,000	2,123,100	1,992,400	1,894,000
Mariculture	991,800	1,088,100	1,198,300	1,137,400	1,327,400	1,272,000	1,272,900	1,261,900
Sub-total	10,900,400	11,965,100	12,539,000	12,266,800	12,586,600	11,711,700	10,842,900	9,773,000
Freshwater Fisheries								
Wild catch	127,700	110,100	106,200	101,000	99,500	103,200	112,100	107,400
Freshwater culture	93,700	96,100	93,700	96,900	98,700	98,500	96,900	97,400
Sub-total	221,400	206,200	199,900	197,800	198,100	201,800	208,900	204,700
Grand Total	11,121,800	12,171,300	12,738,900	12,464,600	12,784,700	11,913,500	11,051,800	9,977,700

Source: *Gyogyo Yoshoku Seisan Tokei Nenpo,* Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries.

Appendix F.-- Japan. Distant-water catch, by type of fishery, 1980, 1985-91.

Type of Fishery	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Trawlers								
Northern Trawlers	422,505	309,613	350,649	418,818	371,363	339,944	173,746	28,560
Converted Trawlers	36,977	66,263	103,191	113,479	120,261	143,334	100,095	46,880
Hokuten Trawlers	208,309	167,778	356,508	331,866	299,289	200,378	148,339	76,934
Southern Trawlers	202,816	259,845	325,246	429,234	450,451	384,230	321,960	252,070
Shrimp Trawlers	3,437	2,958	3,091	2,601	1,656	1,155	1,345	1,195
E. China Trawlers	198,705	125,913	119,558	120,895	97,596	89,809	79,466	79,811
Total Trawler Catch	1,072,749	932,370	1,258,243	1,416,893	1,340,616	1,158,850	824,951	485,450
Driftnet-Squid	-	140,963	121,773	165,058	130,283	141,263	145,342	86,566
Squid Jigging&	451,209	234,334	215,557	416,189	405,111	436,523	95,194	124,069
Distant-water Tuna								
Longliner	211,997	232,704	229,035	201,781	216,483	169,405	169,364	180,357
Pole-and-line	206,822	119,004	158,914	141,301	141,451	126,259	84,611	109,780
Purse Seine	-	139,697	156,749	136,899	168,617	140,594	158,874	169,493
Total Distant-water Tuna Catch	418,819	491,405	544,698	479,981	526,551	436,258	412,849	459,630
Total@	1,942,777	1,799,072	2,140,271	2,478,121	2,402,561	2,172,894	1,478,336	1,155,715

& - Squid jigging statistics include coastal and off-shore jigging until 1990.

@ - Total figures do not equal total figures for distant-water fisheries in Appendix D because other minor distant-water fisheries are excluded.

Source: *Gyogyo Yoshoku Seisan Tokei Nenpo,* Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries.

Appendix G. -- Japan. Northern Trawlers, converted trawlers, and Hokuten trawlers; number of vessels, and catch by quantity (metric tons).

Year	Northern Trawlers		Converted Trawlers		Hokuten Trawlers	
	Number of Vessels	Catch	Number of Vessels	Catch	Number of Vessels	Catch
1980	40	422,505	16	36,977	97	208,309
1985	29	309,613	14	66,263	54	167,778
1986	28	350,649	11	103,191	54	356,508
1987	30	418,818	11	113,479	54	331,866
1988	33	371,363	12	120,261	54	299,289
1989	33	339,944	13	143,334	54	200,378
1990	31	173,746	13	100,095	54	148,339
1991	12	28,560	11	46,880	47	76,934

Source: *Gyogyo Yoshoku Seisan Tokei Nenpo, 1993,* Statistics and Information Department, Ministry of Agriculture, Forestry, and Fisheries.

Appendix H. -- Japan. Northern Trawlers, converted trawlers, and Hokuten trawlers catch composition, by quantity (metric tons).

Vessel	Year	Alaska Pollock	Pacific Cod	Flatfish	Rockfish	Others	Total
			Metric tons				
Northern Trawlers	1986	324,690	1,801	18,192	2	5,964	350,649
	1987	407,032	1,994	2,750	3	7,042	418,818
	1988	368,583	-	-	-	2,780	371,363
	1989	338,485	-	-	-	1,459	339,944
Converted Trawlers	1986	91,186	830	10,831	-	344	103,191
	1987	111,082	969	1,293	-	135	113,479
	1988	120,161	-	-	-	-	120,261
	1989	143,334	-	-	-	-	143,334
Hokuten Trawlers	1986	342,419	1,936	9,550	302	2,301	356,508
	1987	322,458	4,873	2,979	338	1,168	331,866
	1988	295,334	242	218	717	2,778	299,289
	1989	194,699	217	176	316	4,970	200,378

Source: *Suisan Nenkan*, 1992.

Appendix I.-- Japan. Status of the Japanese North Pacific large factory trawler fleet, 1990-93.

Vessel Name	Company Name	Tonnage	Date Launched	Vessel Status
Dai 5 Tenyo Maru	Taiyo	4,370	March 1973	Exported to U.S. August 1990▲
Dai 3 Zuiyo Maru	Hakodate High-seas	3,037	April 1968	Exported to China October 1990
Takachiho Maru	Nissui	3,608	November 1964	Exported to Somalia/Honduras January 1991
Yamato Maru	Nissui	3,990	July 1970	Exported to Argentina January 1991
Miyajima Maru	Nissui	6,370	December 1985	Exported to USSR February 1991♯
Chikuzen Maru	Nissui	7,060	August 1987	Sold to Cooperative Shipping Firm June 1991-Conducting Minke Whaling Research♥
Tenyo Maru	Taiyo	4,329	January 1971	Collided with Chinese Vessel and Sunk July 1991
Otori Maru	Otori	4,662	October 1970	Exported to Argentina August 1991
Dai 3 Tenyo Maru	Taiyo	4,357	November 1972	Exported to Argentina October 1991
Dai 28 Daishin Maru	Kyokuyo	2,995	April 1981	Exported to China February 1992-operating in New Zealand waters
Dai 22 Daishin Maru	Kyokuyo	2,749	June 1964	Exported to Hong Kong for scrap March 1992
Dai 3 Koyo Maru	Hosui	3,431	January 1972	Exported to Cyprus April 1992
Takeo Maru	Hoko	5,460	June 1971	Exported to India April 1992♦
Dai 77 Akebono Maru	Nichiro	3,794	September 1986	Exported to Argentina June 1992♣
Tsuda Maru	Hoko	4,317	October 1971	Export to Russia under consideration
Ichizen Maru	Nissui	2,302	September 1978	Converted to Southern Trawler♠
Dai 8 Koyo Maru	Nissui	4,991	December 1987	Converted to Southern Trawler
Rikuzen Maru	Nissui	3,939	September 1970	Converted to Southern Trawler
Chiyo Maru	Hakodate High-seas	3,641	March 1978	Converted to Southern Trawler
Dai 2 Tenyo Maru	Hakodate High-seas	4,351	April 1972	Joint Venture Operations in Canada
Dai 31 Akebono Maru	Nichiro	1,295	March 1974	Joint Venture Operations in Russia

Source: *Suisan Shuho*, August 25, 1992.

▲ - Renamed the *Excellence*.
♯ - Sold to Dalmoreprodukt Company for $24 million and renamed the *Victoria*.
♥ - Sold for $13 million.
♦ - Sold to the Oriental High-seas Fisheries Company and renamed the *Oriental Angel*.
♣ - Sold to the Pesqueras Company for $9 million and renamed the *Centurion del Atlantico*.
♠ - Southern Trawler refers to factory trawler operations in waters of the South Atlantic, South Pacific, and Antarctica.

Appendix J. -- Japan. Southern trawlers, by region and number of vessels, 1985-90.

Region	1985	1986	1987	1988	1989	1990
Number of vessels						
Northeast North America	11	11	8	5	5	5
Southwest Atlantic	22	28	27	21	14	7
Northwest Africa	-	1	1	1	-	-
South Africa	10	12	10	8	7	5
Atlantic Ocean-Other	12	10	6	7	3	5
Indian Ocean-Other	3	4	1	-	1	-
New Zealand	17	22	29	32	33	32
Pacific Ocean-Other	3	2	2	3	8	-
Subtotal	78	90	84	77	71	54
Antarctica	7	9	8	7	7	8
Total	85	99	92	84	78	62

Source: *Suisan Nenkan*, 1992.

Appendix K. -- Japan. Foreign Allocations for southern trawlers, by major countries and quantity, 1982-91.

Year	South Africa	Canada	USA	Greenland	New Zealand	Total
Metric tons						
1982	33,075	25,100	20,817	-	42,900	121,892
1983	33,075	28,100	5,269	-	76,000	142,444
1984	33,075	38,100	2,914	-	64,020	138,109
1985	33,075	38,000	1,968	38,000	64,580	175,623
1986	24,550	40,000	802	40,000	64,792	170,144
1987	23,170	40,000	6	24,000	35,713	122,889
1988	22,250	39,840	-	24,000	15,653	101,743
1989	12,875	38,640	-	-	10,033	61,548
1990	9,680	35,760	-	8,000	5,632	59,072
1991	6,150	33,566	-	1,285	-	41,001

Source: *Suisan Nenkan*, 1992.

Appendix L. -- Japan. Southern trawler catch, by region and quantity, 1986-90.

Region	1986	1987	1988	1989	1990
			Metric tons		
Northeast North America	11,812	10,782	8,681	9,298	10,918
Southwest Atlantic	54,580	104,419	85,570	51,210	14,673
Northwest Africa	1,209	2,171	813	-	-
South Africa	20,848	16,624	18,919	12,448	11,205
Atlantic Ocean-Other	9,847	3,246	4,152	851	5,525
Indian Ocean-Other	993	321	-	206	2
New Zealand	157,514	204,467	249,037	226,589	209,658
Pacific Ocean-Other	7,370	8,815	10,062	4,606	926
Subtotal	264,172	350,844	377,233	305,206	252,963
Antarctic Krill	61,710	78,389	73,230	79,013	68,989
Total	325,882	429,234	450,463	384,219	321,952

Source: *Suisan Nenkan*, 1992.

Appendix M. -- Japan. Southern trawler catch composition, by species and quantity, 1981-90.

Species	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
					Metric tons					
Hake	8,454	8,234	7,149	6,724	7,257	15,680	18,905	20,109	17,751	9,858
Hoki (NZ)	25,223	21,978	23,241	31,735	30,398	75,903	127,387	182,399	140,569	154,318
Ground-fish	3,479	4,554	4,023	8,081	7,040	16,321	21,297	40,009	20,629	9,279
Sea Bream	9,547	3,302	1,598	1,678	3,334	2,828	2,937	2,423	1,505	1,382
Butterfish	5,992	6,886	4,731	4,182	8,064	7,429	5,317	5,581	4,807	6,615
Jack Mackerel	36,446	25,862	30,955	41,054	27,763	31,618	28,360	32,179	21,151	19,868
Barracuda	14,549	7,834	8,668	8,763	8,402	8,663	9,002	5,993	5,707	4,502
Cuttlefish	1,855	89	-	7	135	364	108	1	-	-
Loligo Squid	6,952	4,872	4,758	3,008	643	5,981	4,232	1,160	4,592	4,677
Illex Squid	45,256	57,768	37,392	82,590	81,962	46,777	89,710	45,245	56,609	10,250
Octopus	7,845	725	-	5	2	84	26	11	3	-
Other	4,886	4,326	4,158	4,528	5,862	6,073	5,928	4,808	4,220	5,581
Krill	27,832	35,909	42,573	49,642	38,374	61,074	78,389	73,230	79,013	68,989
Total	219,816	204,433	197,517	271,530	259,845	325,246	429,233	450,463	384,219	321,952

Source: *Suisan Nenkan*, 1992.

Appendix N. -- Japan. Shrimp trawler catch, by country and quantity, 1985-90.

Country	1985	1987	1988	1989	1990
			Metric tons		
Colombia	213	86	264	252	148
Guyana	74	100	128	92	98
Suriname	531	552	408	436	512
French Guiana	532	-	-	-	-
Brazil	616	762	508	306	175
Nicaragua	-	165	-	-	-
Total	1,966	1,665	1,308	1,086	933

Source: *Suisan Nenkan*, 1992.

Appendix O. -- Japan. Squid Jigging Fleet, by number of vessels, fishing ground, and catch (metric tons), 1985/86-1990/91.

Number of Vessels/Catch	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
SW Atlantic Vessels	84	117	110	99	88	82
SW Atlantic Catch	82,002	184,299	194,377	160,122	81,760	108,634
New Zealand Vessels	84	112	67	138	45	29
New Zealand Catch	24,871	26,435	35,455	49,699	7,910	8,539
Total Vessels*	115	165	172	160	135	111
Total Catch	106,907	210,734	229,832	209,821	93,610	117,173

* - Many Japanese squid jigging vessels operate in both grounds.
Source: *Suisan Nenkan*, 1992.

Appendix P. -- Japan. Composition of squid driftnet fleet, by vessel capacity and fishing season, 1989-91.

Type of Vessel/Fishing Season		1989	1990	1991
			Number of Vessels	
59GRT-100GRT	4 Months	14	7	4
	7 Months	182	188	192
100GRT-500GRT	4 Months	0	0	1
	7 Months	264	262	257
Subtotal	4 Months	14	7	5
	7 Months	446	450	449
Grand Total		460	457	454
Total Catch (metric tons)		141,263	145,000	-
Value of Catch (Yen)		¥45.5 billion	-	-

Source: *Suisan Nenkan, 1992.*

Appendix Q. -- Japan. Squid catch, by method and quantity, 1986-90.

Year	Jigging	Driftnet	Southern Trawl	Coastal	Other	Total
			Metric tons			
1986	215,000	117,000	53,000	21,000	57,000	464,000
1987	416,000	161,000	94,000	24,000	60,000	755,000
1988	405,000	123,000	46,000	26,000	63,000	644,000
1989	436,000	136,000	61,000	28,000	72,000	734,000
1990	289,000	141,000	14,000	23,000	67,000	532,000

Source: *Suisan Nenkan*, 1992.

Appendix R. -- Japan. Composition of squid driftnet fleet, by gear type, 1991.

Gear Type	Pct.
Billfish driftnet	42.7
Salmon Driftnet	29.5
Saury	25.6
Tuna	18.3
Squid Jigging	15.2
Trawlers (*Hokuten*)	7.3
Longliners	2.9
Others	4.0
Squid driftnets (exclusive)	12.1

Note: Since some vessels engage in multiple fisheries, the sum of percentages exceeds 100 percent.
Source: *Suisan Nenkan*, 1992.

Appendix S. -- Japan. Fishing Seasons for vessels in squid driftnet fishery.

Gear Type(s)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Squid Driftnet Only						Squid Driftnet						
Billfish Driftnet	Billfish Driftnet					Squid Driftnet						
Billfish Driftnet /Tuna	Tuna			Billfish Driftnet		Squid Driftnet					Tuna	
Billfish Driftnet/ Salmon Driftnet	Billfish Driftnet				Salmon Driftnet			Squid Driftnet			Billfish Driftnet	
Tuna/Salmon Driftnet	Tuna				Salmon Driftnet			Squid Driftnet			Tuna	
Billfish Driftnet/Saury/ Salmon Driftnet	Billfish Driftnet				Salmon Driftnet			Squid	Open	Saury	Squid Driftnet	
Distant-water Squid Jigging	Squid Jigging					Squid Driftnet			Squid Jigging			
Distant-water trawling (*Hokuten*)	North Pacific Trawling					Squid Driftnet			N Pacific Trawling			

Source: *Suisan Nenkan, 1992.*

Appendix T. -- Japan. High-seas squid driftnet vessel compensation program, 1992-94.

Vessel Size	Year of Retirement	Compensation for Expenses	Special Solatium	Vessel Value	Prefecture* Compensation	Total
			1,000 Yen			
130GRT+ (exclusive)	1992	31,600	30,000	48,500	24,300	134,400
	1993	25,500	30,000	42,000	21,000	118,500
	1994	19,500	30,000	37,700	18,800	106,000
130GRT+ (seasonal)	1992	19,000	26,000	57,200	28,600	130,800
	1993	13,000	26,000	53,200	26,600	118,800
	1994	6,900	26,000	51,000	25,530	109,430
Under 130GRT (exclusive)	1992	25,500	15,000	26,300	14,200	83,000
	1993	22,500	15,000	27,900	14,000	79,400
	1994	19,400	15,000	27,000	13,500	74,900
Under 130GRT (seasonal)	1992	14,700	10,000	27,500	13,700	65,900
	1993	12,700	10,000	27,300	13,700	63,700
	1994	10,700	10,000	27,000	13,500	61,200

* - The Japanese Government would like Prefectural Governments to pay this compensation, but they are not legally obligated.
Source: Fisheries Agency of Japan.

Appendix U. -- Japan. Large-mesh driftnet vessel compensation program, 1992.

Vessel Size	Year of Retirement	Compensation for Expenses	Special Solatium	Vessel Value	Prefecture* Compensation	Total
			1,000 Yen			
130GRT+ (exclusive)	1992	21,200	5,000	48,500	24,300	99,000
130GRT+ (seasonal)	1992	13,600	5,000	57,200	28,600	104,400
Under 130GRT (exclusive)	1992	21,700	5,000	28,300	14,200	69,200
Under 130GRT (seasonal)	1992	13,500	5,000	27,500	13,700	59,700

* - The Japanese Government would like Prefectural Governments to pay this compensation, but they are not legally obligated .
Source: Fisheries Agency of Japan.

Appendix V. -- Japan. Salmon vessel compensation program, 1990-92.

Vessel Type	Licensed Vessels-1990	Vessels Scheduled to be Removed			Vessels Remaining
		1990	1991	1992	
		Number of vessels			
Non-traditional land-based vessels (former mothership fleet)	129	97	2	2	28
Traditional land-based vessel (medium-sized driftnet vessels)	157	74	23	0	60
Small coastal vessels in Pacific Ocean	433	112	61	0	260
Longliners in the Sea of Japan	69	26	17	8	18
Driftnet vessels in the Sea of Japan	64	17	12	0	35
Driftnet vessels in Tsugaru Strait	54	4	25	7	18
Removed at owners' expense		10	10	9	
Removed under Japanese Government compensation		320	130	8	
Grand total	906	330	140	17	419
Compensation Budget (millions of U.S. dollars)		229	25	129*	

* - This figure is the total compensation budget for the salmon, squid driftnet, and *hokuten* trawler fleets. Separate breakdowns are not available.
Source: US Embassy, Tokyo, February 25, 1993.

Appendix W. -- Japan. Distant-water tuna vessels, by number and capacity, 1985-92.

Year	Longliners		Pole and Liners		Purse Seiners	
	Number	GRT	Number	GRT	Number	GRT
1985	795	216,272	155	48,741	NA	NA
1986	792	222,703	146	47,894	32	NA
1987	789	229,728	143	48,097	32	NA
1988	786	235,893	108	34,618	32	NA
1989	763	NA	108	NA	34	NA
1990	773	NA	100	NA	44	NA
1991	762	NA	106	NA	45	NA
1992	759	NA	81	NA	49	NA

Sources: *Suisan Nenkan,* 1992; US Embassy Tokyo, 14 April 1992; *Katsuo-Maguro Tsushin* , No. 6665, November 30, 1992.

Appendix X. -- Japan. Distant-water Japanese tuna fishing grounds, vessel types, and number of vessels, 1990.

Fishing Ground	Vessel Type	Number of Vessels
South-Central Pacific Ocean	Pole and Line	Over 100
Northwest Pacific Ocean	Small Longliners	Over 100
Northeast Pacific Ocean	" "	80-100
West-Central Pacific Ocean	" "	Over 200
Southeast Pacific Ocean	Large Longliners	10-15
Northwest Indian Ocean	" "	5-6
Eastern Indian Ocean	" "	10-15
South Atlantic Ocean	" "	30-35
North Atlantic Ocean	" "	25-30
Other	" "	200-220

Source: *Asian Development Bank/Infofish Tuna Industry Update*, 1991.

Appendix Y. -- Japan. Southern bluefin tuna distant-water fisheries, by fishing ground, season, and number of vessels.

Fishing Ground	Fishing Season	Number of Vessels
New Zealand (Government Agreement)	15 March to 15 August 1992	38
New Zealand (Charter vessels)	15 March to 30 September 1992	5
Tasman Sea (Government Agreement)	15 May to quota attained	12
Tasman Sea (Charter vessels)	15 May to quota attained	30
Tasman Sea (International waters)	15 May to 31 July 1992	40
Off Cape Town, South Africa	15 April to 15 August 1992	120
Southern Indian Ocean	15 August to end of season	70

Source: *Katsuo-Maguro Tsushin*, No. 6420, November 22, 1991.

Appendix Z. -- Japan. Number of fishery workers and average annual earnings, by sex, age, and type of fishery, 1986-91.

Type of Worker	Year					
	1986	1987	1988	1989	1990	1991
Number of workers (thousands)						
Men						
15-39 Years Old	94	88	88	76	68	61
40-59 Years Old	181	175	161	158	150	140
Over 60 Years Old	74	76	76	81	86	89
Women (All Ages)	74	72	68	68	67	65
Total	423	411	392	383	371	355
Coastal Fishery Workers	331	326	314	308	300	
Medium-Large Scale Fishery Workers	92	85	78	75	70	
Average Annual Earnings of Coastal Fishermen						
(1,000 Dollars)	7.5	9.5	11.1	11.3	10.2	12.5

Sources: *Fisheries Statistics of Japan*, 1991; *Suisan Nenkan*, 1992.

Appendix AA. -- Japan. Shipyards building fishing vessels over 100GRT, 1980, 1985-91.

	Year							
	1980	1985	1986	1987	1988	1989	1990	1991
Number of Shipyards	58	34	35	34	28	30	26	23
Number of Vessels built	210	140	121	154	133	140	129	97
Total GRT of Vessels	54,191	45,401	49,577	55,361	47,341	41,695	39,977	30,141

Source: *The Journal of the Fishing Vessel Association of Japan*, Nos. 234, 276, 282, 294, and 300.

Appendix BB. -- Japan. Number of major fishing vessels built, 1990-91.

Vessel Type	1990	1991
Trawler	0	0
Salmon Driftnet	0	0
Tuna Vessels	90	60
Purse Seiners	6	7
Other	33	20
Total	129	87

Source: *Journal of Fishing Vessel Association of Japan*, Number 300.

Appendix CC. -- Japan. Steel fishing vessel construction, by vessel class and number of vessels, 1989-90.

Vessel Class (By GRT)	Approved for Construction				Construction Completed			
	1989		1990		1989		1990	
	Number	Total Capacity	Number	Total Capacity	Number	Total Capacity	Number	Total Capacity
Less than 50	51	1,017	52	988	46	902	55	1,097
50-100	19	1,550	25	1,841	23	1,838	26	1,968
100-200	45	6,329	29	3,780	42	5,839	34	4,806
200-300	10	2,866	6	1,606	7	1,859	10	2,795
300-500	105	39,411	67	25,362	91	33,997	85	32,396
500-1,000	-	-	-	-	-	-	-	-
Over 1,000	1	2,559	-	-	-	-	-	-
Total	231	53,732	179	33,577	209	44,435	210	43,062

Source: *Suisan Nenkan*, 1992.

Appendix DD. -- Japan. Exports of fishing and fish processing vessels made of steel, 1980.

Export Destination	Number Exported	Total GRT	Total FOB $Value (millions)
New Vessels			
Panama	7	749	5.7
Bangladesh	5	991	6.4
Canada	3	2,949	12.4
Others (11)	20	3,753	24.1
Subtotal	35	8,442	48.6
Used Vessels			
Philippines	39	6,590	3.4
Panama	8	3,247	2.7
China	7	1,373	0.7
Singapore	1	299	0.3
Others (12)	31	14,396	13.5
Subtotal	86	25,905	20.6
Grand Total	121	34,347	69.2

Source: *Japan Imports and Exports*, 1980.

Appendix EE. -- Japan. Exports of fishing and fish processing vessels made of steel, 1985.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Madagascar	3	285	2.2
Mozambique	2	438	2.3
Senegal	1	282	2.3
Philippines	1	110	0.6
Subtotal	7	1,115	7.4
Used Vessels			
Philippines	31	3,011	0.7
China	23	4,047	4.4
Panama	13	4,034	1.9
Honduras	5	1,324	0.7
Argentina	2	698	0.5
Vanuatu	2	583	0.3
Cayman Islands	2	582	0.4
Others (18)	27	7,069	6.2
Subtotal	105	21,348	15.1
Grand Total	112	22,463	22.5

Source: *Japan Imports and Exports*, 1985.

Appendix FF. -- Japan. Exports of fishing and fish processing vessels made of steel, 1986.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Madagascar	6	852	7.7
China	4	1,204	6.3
Guyana	4	72	2.1
Thailand	1	1,424	11.1
Vietnam	1	498	2.5
Morocco	1	400	3.2
Togo	1	55	0.4
Tanzania	1	148	1.2
Papua New Guinea	1	154	1.1
Subtotal	20	4,807	35.6
Used Vessels			
Philippines	44	5,318	2.0
China	18	4,119	3.4
Panama	13	6,119	4.0
Mauritania	10	2,540	4.3
Republic of Korea	10	1,390	1.9
Honduras	7	1,640	1.8
Oman	4	1,412	2.4
Greece	4	788	0.3
United Arab Emirates	4	635	0.1
Venezuela	3	836	1.2
North Korea	3	793	1.1
Argentina	2	848	3.4
Cayman Islands	2	603	0.9
Singapore	1	254	0.1
Others (21)	26	5,526	7.1
Subtotal	151	32,821	34.0
Grand Total	171	37,628	69.6

Source: *Japan Imports and Exports*, 1986.

Appendix GG. -- Japan. Exports of fishing and fish processing vessels made of steel, 1987.

Export Destination	Number Exported	Total GRT	Total FOB $Value (millions)
New Vessels			
Mauritius	1	1,039	6.8
Subtotal	1	1,039	6.8
Used Vessels			
Philippines	37	4,161	2.0
Honduras	13	3,598	4.0
Panama	11	2,640	6.9
ROK	9	1,838	2.3
China	9	2,231	4.4
Sierra Leone	6	2,429	2.6
Taiwan	3	1,019	0.9
Gambia	2	698	1.4
Senegal	2	698	1.8
Ghana	2	672	0.3
United Arab Emirates	2	550	0.4
Costa Rica	2	528	0.1
Argentina	2	473	4.2
Mauritius	2	352	1.1
Vanuatu	2	303	0.2
Cayman Islands	1	1,197	1.0
Kuwait	1	999	0.5
Guinea Bissau	1	349	0.9
Venezuela	1	299	0.4
St. Vincent-Grenadines	1	298	0.2
Singapore	1	293	0.4
Others (5)	6	1,066	3.1
Subtotal	116	26,691	39.1
Grand Total	117	27,730	45.9

Source: *Japan Imports and Exports,* 1987.

Appendix HH. -- Japan. Exports of fishing and fish processing vessels made of steel, 1988.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Madagascar	2	200	2.5
Mozambique	1	219	2.0
Subtotal	3	419	4.5
Used Vessels			
Philippines	38	3,664	2.0
Taiwan	23	3,202	6.5
Honduras	13	3,311	4.8
Sierra Leone	10	2,094	3.9
St. Vincent-Grenadines	8	2,170	1.4
United Arab Emirates	8	1,488	2.2
Panama	6	1,682	2.2
China	5	738	1.2
Indonesia	5	380	2.8
Argentina	4	1,286	4.5
North Korea	2	886	0.3
Liberia	2	823	1.1
Gambia	2	702	1.1
Ghana	2	613	0.5
Cayman Islands	1	299	0.6
Vanuatu	1	284	0.2
United States	1	3,241	18.5
Others (20)	22	3,139	7.7
Subtotal	153	30,002	61.5
Grand Total	156	30,421	66.0

Source: *Japan Imports and Exports*, 1988.

Appendix II. -- Japan. Exports of fishing and fish processing vessels made of steel, 1989.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
India	2	630	5.7
Egypt	2	386	5.1
Mozambique	2	438	3.8
Madagascar	2	200	2.3
Subtotal	8	1,654	16.9
Used Vessels			
Philippines	35	3,905	2.1
Panama	11	3,928	1.9
Chile	10	5,534	14.4
Sierra Leone	8	1,921	2.5
Bangladesh	8	506	2.2
Ghana	7	2,074	2.3
Honduras	5	2,501	0.4
Indonesia	5	1,033	3.2
Costa Rica	5	1,014	2.4
Nigeria	4	773	0.4
St. Vincent-Grenadines	4	741	0.6
Malta	4	657	0.3
Taiwan	4	625	1.2
Vanuatu	3	851	0.7
China	3	554	0.7
Malaysia	3	505	0.5
Senegal	2	783	1.2
Kuwait	2	648	2.2
Sri Lanka	2	598	0.9
Others (13)	17	3,680	8.4
Subtotal	142	32,831	48.5
Grand Total	150	34,485	65.4

Source: *Japan Imports and Exports*, 1989.

Appendix JJ. -- Japan. Exports of fishing and fish processing vessels made of steel, 1990.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Madagascar	2	200	2.2
Cayman Islands	1	582	3.7
Colombia	1	60	1.1
Subtotal	4	842	7.0
Used Vessels			
Philippines	42	6,147	4.6
Panama	20	9,135	6.8
Singapore	13	1,825	1.6
Honduras	7	1,319	1.1
Indonesia	7	1,236	2.1
North Korea	5	54	0.02
China	4	3,389	5.1
Vanuatu	4	1,316	2.2
Malaysia	4	505	0.4
Argentina	3	1,342	1.9
Senegal	3	1,141	1.6
Costa Rica	3	613	0.4
Guatemala	2	703	1.2
Ghana	2	678	1.3
Uruguay	2	517	0.5
Solomon Islands	2	331	0.6
Sri Lanka	2	38	0.2
India	1	7,414	1.5
Libya	1	2,589	1.5
Bangladesh	1	378	0.3
Oman	1	349	1.9
Columbia	1	342	1.1
Guinea	1	299	1.0
St Vincent-Grenadines	1	299	0.6
Madagascar	1	299	1.3
Mauritius	1	288	0.2
United States	1	4,370	17.1
Others (14)	14	1,939	3.6
Subtotal	150	48,855	61.7
Grand Total	154	49,697	68.7

Source: *Japan Imports and Exports*, 1990.

Appendix KK. -- Japan. Exports of fishing and fish processing vessels made of steel, 1991.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Indonesia	1	580	4.0
India	1	343	3.0
Subtotal	2	923	7.0
Used Vessels			
Philippines	45	5,078	2.8
Panama	13	6,004	6.9
China	11	24,837	4.4
Honduras	9	4,403	3.4
Malaysia	6	1,179	1.4
Vanuatu	5	1,055	0.9
Malta	5	521	0.2
Argentina	4	13,473	12.1
Singapore	4	825	0.7
Palau	4	375	0.3
Ghana	3	1,184	2.3
Soviet Union	2	6,868	24.1
Guatemala	2	722	1.2
St Vincent-Grenadines	2	598	1.3
Gambia	2	563	1.9
Sierra Leone	2	480	1.4
Tonga	1	4,970	0.02
Guinea Bisseau	1	1,497	1.1
Guinea	1	343	0.6
Suriname	1	299	0.9
Ecuador	1	299	0.5
Cape Verde	1	299	0.3
Mauritius	1	299	0.6
Cayman Islands	1	299	0.09
Taiwan	1	271	0.9
Costa Rica	1	284	0.2
Hong Kong	1	234	0.3
Others (5)	5	259	0.2
Subtotal	136	77,518	71.0
Grand Total	138	78,441	78.0

Source: *Japan Imports and Exports*, 1991.

Appendix LL. -- Japan. Exports of fishing and fish processing vessels made of steel, 1992.

Export Destination	Number Exported	Total GRT	Total FOB $ Value (Millions)
New Vessels			
Malaysia	1	162	3.1
Subtotal	1	162	3.1
Used Vessels			
Philippines	55	9,991	4.9
Panama	16	2,960	1.9
Russia	14	778	1.3
China	12	4,753	6.8
Mauritius	7	2,584	2.5
Indonesia	7	1,606	3.9
Honduras	6	1,831	0.7
Ghana	5	2 ,669	1.1
Malaysia	5	1,554	1.3
North Korea	4	187	0.3
Argentina	2	4,293	9.0
St Vincent-Grenadines	2	748	1.1
Solomon Islands	2	343	0.3
India	1	5,460	2.5
Cyprus	1	3,431	1.3
Taiwan	1	2,471	0.06
Suriname	1	541	0.2
Chile	1	465	0.3
Belize	1	423	0.04
Vietnam	1	391	0.2
Vanuatu	1	344	0.3
Maldives	1	299	0.2
Senegal	1	299	0.2
Others (3)	3	862	2.5
Subtotal	152	49,311	42.9
Grand Total	153	49,473	46.0

Source: *Japan Imports and Exports*, 1992.

Appendix MM. -- Japan. Exports of fishing vessels to China and flag-of-convenience countries, 1985-92.

Year		China	Panama	Honduras	Cayman Islands	St. Vincent	Singapore
Number of vessels/Gross registered tonnage							
1985	No	23	13	5	2	-	-
	GRT	4,047	4,034	1,324	582	-	-
1986	No	22	13	7	2	-	1
	GRT	5,323	6,119	1,640	603	-	254
1987	No	9	11	13	1	1	1
	GRT	2,231	2,640	3,598	1,197	298	293
1988	No	5	6	13	1	8	-
	GRT	738	1,682	3,311	299	2,170	-
1989	No	3	11	5	-	4	-
	GRT	554	3,928	2,501	-	741	-
1990	No	4	20	7	1	1	13
	GRT	3,389	9,135	1,319	582	299	1,825
1991	No	11	13	9	1	2	4
	GRT	24,837	6,004	4,403	299	598	825
1992	No	12	16	6	-	2	-
	GRT	4,753	2,960	1,831	-	748	-
Total	No	89	103	65	8	18	19
	GRT	45,872	36,502	19,927	3,562	4,854	3,197
	Avg. GRT	515	354	307	445	270	168

Source: *Japan Imports and Exports*, 1985-92.

Appendix NN. -- World. Flag of convenience tuna fleets (estimated), 1992.

Country	Tonnage (GRT)	Number of Vessels
Honduras	14,409	72
Panama	11,226	56
Singapore	2,550	13
Ecuador	1,809	9
Saint Vincent	1,710	9
Canary Islands	854	4
Others	7,041	35
Total	39,599	198

Source: *Nikkan Suisan Keizai Shinbun*, July 29, 1992.

Appendix OO. -- Japan. Previous Japanese-flag fishing vessels currently flagged in well-known flag-of-convenience countries, by country, vessel name, capacity, and year built.

Vessel Name	GRT	Year Built
Panama		
Arko Fish No. 8	344	1969
Aurola No. 7	379	1974
Bezdna	301	1972
Cabinda	471	1967
Capesca No. 7	349	1970
Carmen Torres	435	1972
Carol	374	1978
Hope No. 7	456	1968
Ine Maru No. 18	134	1980
Kim's Marine No. 211	385	1971
Km Pulau Adi	496	1977
Koshin Maru No. 51	133	1981
Koun Maru No. 5	166	1975
Koyo Maru No. 101	116	1977
La Paz No. 101	299	1977
Lottee Giant	468	1962
Marine Snow	486	1975
Marushige Maru No. 11	116	1982
Meisho No. 51	299	1971
Meishin 235	406	1970
Melilla No. 101	299	1980
Melilla No. 102	299	1979
Melilla No. 103	344	1978
Melilla No. 201	1,878	1966
Melilla No. 301	242	1971
Melilla No. 303	232	1974
Ming Star	153	1979
Myong Chong 1	206	1956
Namhaieo 003	174	1967
Namhaieo 005	173	1967
Nofa 97	570	1971

Orion VI	672	1979
Osito No. 89	349	1973
Osito No. 92	349	1982
Paramushir 101	448	1977
Paramushir 102	499	1971
Peonia No. 9	2,780	1963
Pesca Mar No. 12	299	1974
Porfesa III	1,006	1960
R Express	374	1970
Red Sea 123	124	1971
Royal Fortune	254	1977
Sea Fox	154	1973
Sea Queen No. 1	355	1974
Sea Queen No. 2	393	1972
Seta No. 1	493	1967
Silvar Mac	344	1979
Sulawesi-1	220	1980
Sumatra No. 2	349	1972
Sun Shine	440	1960
Sur Este No. 705	349	1974
Sur Este No. 707	816	1983
Tatsumi	298	1979
Venezia No. 23	349	1972
Venture Luna	1,246	1982
Victoria No. 8	299	1980
Young No. 9	634	1970
Yuho 1	154	1968
Honduras		
Arco	356	1973
Chidori Maru #23	182	1963
Kaisei No. 2	318	1970
Kyung Dong No. 52	299	1972
Lucky No. 701	344	1979
Lucky No. 702	464	1980
Marine Star VII	349	1974

Or Sirichainava 9	499	1976
Pacific Reefer	431	1970
Pere No. 1	254	1975
Phantom	194	1981
Santa Rosa No. 1	299	1978
Sanyo Maru No. 7	119	1977
Sirichai Independence	1,945	1966
Sirichai Reefer	374	1972
Sirichai Reefer 2	451	1971
Sonrisa	349	1974
Taiki Maru No. 38	284	1975
Taiyo I	1,782	1965
Tokai Maru No. 16	194	1968
Tokai Maru No. 17	193	1968
Vigo No. 2	299	1972
Yamasan Maru No. 81	349	1972
Young No. VII	468	1969
Yuwa Maru	482	1970
Zengyoren Maru No. 8	286	1966
St. Vincent-Grenadines		
Alegria	349	1974
Astro No. 7	299	1980
Koyo Maru No. 8	374	1969
Lilian No. 31	353	1974
Maria No. 3	296	1970
Nereus	299	1979
Nine Star	349	1973
Saint Louis	423	1970
Saint Pietro No. 108	374	1969
Seven Star	492	1967
Six Star	499	1967
Starlet No. 901	362	1980
Three Star	493	1967

Source: U.S. Department of Defense, Office of Naval Intelligence, August 1993.

Appendix PP. -- Japan. Joint Ventures, by area and type of fishery, 1980, 1985-91.

	Year							
	1980	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**
By Area								
Latin America	25	27	25	26	26	25	24	25
Asia/Oceania	104	106	104	111	117	111	111	111
Africa	16	11	11	10	9	7	8	6
Middle/Near East	0	0	0	0	0	0	0	0
Europe	2	1	1	1	1	1	1	1
Russia	0	0	0	0	4	7	10	14
North America	46	39	41	40	40	41	35	35
By Type of Fishery								
Groundfish	19	18	22	24	25	23	24	24
Shrimp Trawl	25	27	24	27	26	21	21	19
Tuna/Skipjack	10	10	9	9	10	10	10	10
Other Fishing	28	23	19	21	27	26	28	32
Aquaculture	31	36	39	41	44	47	49	51
Fish Processing	79	69	68	65	64	64	55	53
Vessel Leasing	1	1	1	1	1	1	2	3
Total	193	184	182	188	197	192	189	192

Source: Fisheries Agency of Japan, *White Paper,* Fiscal Year 1992.

Appendix QQ. -- Japan. Fisheries-related investments in the former Soviet Union/Russia.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
Former Soviet Union/Russia	Nisso Boeki	Soniko	1988	Herring Roe processing
	Hokuyo Godo Suisan	Pilenga Godo	1989	Salmon hatcheries
	Nissui Mitsui Bussan	Okhotsk Suisan	1989	Herring processing
	Taiyo Morikawa Shoji Kita Taiheiyo Gyogyo	Diana	1989	Surimi, fish meal processing
	Tairiku Boeki Tairiky Travel Service	Sakhalin Tairiku	1989	Sea Urchin, Octopus, Shrimp processing
	Hokuyo Kyodo Yokohama Tsusho	Magadan Gyogyo Godo	1989	Cod longlining
	Media Kurafuto	Amur Trading	1990	Fisheries trade, restaurants
	Tokyo Maruichi Shoji	Okean	1990	Fisheries processing, sales
	Utari Kyodo	Aniwa	1989	Aquaculture
	DDS Japan	Daishin Darushi Products	1989	Crab pot fishing

Source: *Suisan Nenkan*, 1992.

Appendix RR. -- Japan. Purchases of Alaska Pollock in Soviet/Russian waters, by quantity, contracted and actual purchases (in parentheses).

Russian Company	1987	1988	1989	1990	1991
	Metric tons				
Sovrybflot	44,000-50,000 (38,940)	87,500 (69,931)	5,000 (1,806)	1,441 (1,464)	- -
Seasafisco	- -	- -	11,000 (2,666)	24,000 (14,349)	15,000 (14,849)
Dalmore	- -	- -	- -	- -	15,000 (14,966)
Amur Trading	- -	- -	- -	- -	11,000 (10,786)
Sakhalin Continent	- -	- -	- -	- -	2,000 (2,000)
Total	44,000-50,000 (38,940)	87,500 (69,931)	16,000 (4,472)	25,441 (16,313)	43,000 (42,732)

Source: *Suisan Nenkan*, 1992.

Appendix SS. -- Japan. Fisheries-related investments in East Asia.

Location	Japanese Investors	Local Company Name	Date of Permission	Company Activities
China	Taiyo	Zhoushan Joint Fisheries Company	1985	Trawling
	Yamanaga Suisan	Sino-Japanese Shenzhen Marine Fisheries Corporation	1986	Trawling
	Yamato Kogyo	Huaxing Seafood Corporation	1985	Trawling, Aquaculture
	Kudo Suisan	Qingbei Fisheries Corporation	1986	Processing, Refrigeration
	Daiso Sogyo	Yantai Yanda Fisheries Corporation	1990	Snapper culture, shellfish fishing
	Niihama Shoji	Ruifu Distant-water Fisheries Corporation	1986	Trawling
	Kadonaga Boeki	Dandong Changxing Shellfish Culture Corporation	1990	Shellfish culture
	Yoshu Kogyo	Mouping Oceanic Industry Corporation	1989	Aquaculture, Processing
Hong Kong	Yasuda Shoten	Yasuda Co., Ltd.	1976	Frozen surimi processing
	Daiei Bussan	Lan tao Island Fishing Co., Ltd.	1974	Eel/freshwater culture
	Toshiba Hoju	National Fishing Industries Ltd.	1977	Snapper, shrimp culture
	Toyo Trading	Alfred Finance and International Trading Co., Ltd.	1973	Eel culture
Taiwan	Genroku	Genroku Kokai	1975	Kuruma shrimp/snapper culture
Republic of Korea	Yatsuryu Sangyo	Kankoku Yoman	1970	Eel culture
	Nikko Sangyo	Sanwa Suisan	1971	Eel culture
	Shizuoka Tansui	Kyokuto Yoman	1971	Eel culture
	Sasebo Gyokai	Daitogyokai Yoshoku	1972	Eel culture
	Kyushu Kagaku	Yushin Yoman	1972	Eel culture
	Park Soo Koo	Kokko Bussan	1973	Fisheries processing/sales
	Iwasaki Kimio	Kankoku Kiyo Bussan	1973	Fresh fish processing
	Nishimura Soh	Sanyo Bussan Kaihatsu	1973	Nori production/processing
	Sunclutch Shokai	Sanei Sunclutch	1973	Eel culture
	Minato Yoshio	Sogan Suisan	1973	Mariculture*
	Yoshida Chin	Senko Bussan	1973	Eel culture
	Tosan Shokai	Zuigen Tosan Yoman	1973	Eel culture
	Inaba Seiichi	Sokin Yogyo	1973	Mariculture
	Wakayama Nosuisan	Hoshin Tsusho	1973	Eel culture
	Jusco	Ajinomoto Suisan	1974	Fisheries processing, freezing
	Aisho	Nissei Suisan	1975	Fisheries processing
	Nichimen	Sanko Suisan Kaihatsu	1975	Nori culture/processing
	Sho Shi	Tochu Suisan	1977	Snapper/yellowtail culture
	Showa Kosei	Reisui Suisan	1978	Freezing/refrigeration

Source: *Suisan Nenkan*, 1992. * - currently inactive.

Appendix TT. – Japan. Fisheries-related investments in Indonesia.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
Indonesia	Toho Suisan	P.T. Misaja Mitra Co., Ltd.	1968	Fisheries Processing/Refrigerating
	Sumitomo Shoji	P.T. Central Java Marine Products	1969	Refrigeration, processing, exports
	Nissui Mitsubishi	P.T. West Irian Fishing Industries	1970	Shrimp Trawling
	Nissui Hosui Nissho Iwai	P.T. Irian Product Development	1970	Shrimp trawling, fisheries processing
	Taiyo Mitsui	P.T. Nusantara Fishery	1970	Shrimp Trawling, fisheries processing
	Arafura Shinju	P.T. Pearl Development	1972	Pearl Culture
	Nichiro Mitsubishi	P.T. Alfa Kurnia Fish Enterprise	1973	Shrimp Trawling
	Nichimen Tokusui	P.T. Dwi Bina Utama	1974	Shrimp Trawling
	Mamoyama Development	P.T. Mamoyama Irian Development	1977	Skipjack flakes processing
	Kaneko Shinju Kaneko Sangyo	P.T. Manei Southern Pearl	1978	Pearl Culture
	Kaigai Shokusan	P.T. Minaraya Aceh Fishing Industry	1980	Skipjack flake, shrimp processing
	Kakuta Kaigai Shinju	P.T. Arta Samudra	1981	Pearl Culture
	Indonesia Pearl	P.T. Hikarilampung Permai	1981	Pearl Culture
	Mitsumoto Boeki	P.T. Kendari Mutiara Indonesia	1990	Pearl Culture
	Kyokko Sangyo	P.T. Budaya Mutiara	1990	Pearl Culture
	Nichigo Pearl	P.T. Paloma Agung	1984	Pearl Culture (technical assistance)
	K & S	P.T. Prima Kasindo	1990	Mother pearl culture
	Seven Oceans International	P.T. Tofico	1969	Shrimp trawling, frozen processing
	Nisshin Boeki	P.T. Nisshin Samudera Mutiara	1975	Pearl Culture
	Konan Suisan	Jacana Fishing Corp.	1971	Refrigeration*
	Kyokko Sangyo	P.T. Kyokko Shinju Indonesia	1987	Pearl Culture
	Furuya Kaigai Shinju	P.T. Asa Mutiara Nusantara	1988	Pearl Culture

Source: *Suisan Nenkan*, 1992

*- currently inactive.

Appendix UU. -- Japan. Fisheries-related investments in South and Southeast Asia.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
India	Tomen	Marks Marine & Plastics Ltd.	1974	Fisheries Processing, Sales*
	Kawatetsu Shoji Shimizu Shokai	K.S.K. Fisheries Private Ltd.	1987	Shrimp Trawling
Sri Lanka	Kaneko Sangyo	Kaneko Lanka Marine (Private) Ltd.	1984	Pearl Culture*
	Nakagawa Gyogyo	Lanka Japan Fisheries Combine Ltd.	1985	Squid Jigging, Processing
Bangladesh	Taiyo/Mitsui	Bengal Fisheries Ltd.	1980	Shrimp Trawling
	Hakodate Kokai	Ahamad & Hakokdate Marine Fishing Ltd.	1983	Shrimp Trawling
	Shimizu Shokai	Shimizu Specialized Fishing (P.V.T) Ltd.	1983	Shrimp Trawling
Malaysia	Kansai Supermarket	Top Foods (Malaysia) Sdn. Bhd.	1975	Fisheries Processing
	Kita Borneo Suisan	North Borneo Fishing Company, Ltd.	1962	Shrimp Trawling, Processing
	Mitsumoto Boeki	Kaya Pearl Co., Ltd.	1977	Pearl Culture (technical assistance)
	Toei Bussan	Toei Development Sdn. Bhd.	1973	Frozen Processing
Thailand	Nomura Boeki	The Thai Marine Food Co., Ltd.	1966	Refrigeration
	Yanagi-ya Honten Okura Shoji	Kyu-Thai Co., Ltd.	1971	Fisheries Processing*
	Kibun	Bangkok Frozen Co., Ltd.	1972	Surimi Processing/Sales*
	Sanyo Boeki	Siam Food Supply, Co., Ltd.	1974	Fisheries Processing
	Tomei Shoji	K.H. Fishery Co., Ltd.	1975	Cultured Eel Processing
	Hoko Suisan	MBK-Hoko Co., Ltd.	1986	Finfish and shrimp culture
	Southsea Pearl	Naga Pearl Co., Ltd.	1979	Pearl Culture (technical assistance
	Mitsubishi Shoji	Thai Prawn Culture Center Co., Ltd.	1985	Shrimp Culture (juvenile production)
Philippines	Konan Suisan	Concord Fishing Corp.	1973	Shrimp trawling*
	Sugabu Fishing Company	Sugabu Fishing Co., Inc.	1972	Skipjack/tuna fishing*
	Nichihi Boeki Nantan Kogyo	Fil-Marine Resources Development Corp.	1973	Eel Culture
	Takihyo	Taki Fish Industry (Phil.) Inc.	1974	Cultured fish (eel) sales
	Showa Denko Apollo Boeki	Showa United Food Inc.	1973	Aquaculture, processing, exports
	Komatsu Suisan	Komatsu Aquatic Product Inc.	1976	Fisheries Processing/Refreigeration

Source: *Suisan Nenkan*, 1992
* - currently inactive.

Appendix VV. -- Japan. Fisheries-related investments in Oceania.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
Micronesia	Sanfuji Shoji	Fishing Corporation of the FSM	1989	Pole fishing
	Nichinan Kaihatsu	Truk & Nippon Fishing Inc.	1977	Coastal fishing*
	Kyokuyo Gyogyo	Micronesia Ocean Developments Co.	1979	Bait fishing*
Northern Marianas	Japan-Micronesia Sogo Kaihatsu	Japan Mariana Fishing Co., Ltd.	1978	Bottomfish fishing*
	Tokyo Sales	South Pacific Marine Products Co., Ltd.	1976	Coastal fishing*
	Marufuji Sangyo	Saipan Fishing Co., Ltd.	1979	Shrimp fisheries, processing*
	Nihon-Mariana Kaihatsu	Northern Marianas General Development Co., Ltd.	1979	Coastal Fishing
Marshall Islands	Nanyo Shigen	Nankatsu Corporation, Inc.	1984	Skipjack fishing, processing
Papua New Guinea	Hosui Nissui	New Guinea Marine Product Pty., Ltd.	1972	Shrimp trawling, refrigeration
Solomon Islands	Taiyo	Solomon Taiyo Ltd.	1973	Skipjack fishing, processing
Fiji	Sanyo Gyogyo	Neptune (Fiji) Ltd.	1987	Bottomfish fishing
Vanuatu	Hakodate Kokai	Cavana Marine Company Ltd.	1988	Shrimp Trawling
New Caledonia	Sangen Suisan	Polypeche S.A.	1981	Coastal fishing*
	Matsuya	Caledonie Kaiun S.A.	1985	Tuna longlining
	Nissui Taiseimaru Kaiun	Societe Caledonienne des Peches Industrielles	1989	Trawling
French Polynesia	Tasaki Shinju	Development Co. for Tahitian Pearl	1988	Pearl Culture
Australia	Kyushu Shinju	Kyushu Shinju Co., Ltd.	1990	Pearl Culture
	Itochu	Snowy Mountain Trout Holing Pty., Ltd.	1973	Freshwater trout culture*
	Nichigo Suisan	A.J. Seafoods Pty., Ltd.	1974	Frozen processing*
	Zengyoren, Hachinoe Gyoren	Tasmanian Fisheries Co.	1978	Squid Jigging*
	Kyokko Sangyo	Sun Pearl Co. Pty., Ltd.	1982	Squid Jigging*
	Nikkatsuren	Australia Japan Tuna Pty., Ltd.	1989	Tuna longlining
	Hamaguchi Shinju	-	1982	Pearl Culture
	Koyo Shinju	-	1988	Pearl Culture

Source: *Suisan Nenkan*, 1992

* - currently inactive

Appendix WW. -- Japan. Fisheries-related investments in Oceania and Africa.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
New Zealand	Nichimo	Jaybel Nichimo Fishing Ltd.	1973	Processing, trawling, squid jigging
	Toshoku Takara Gyogyo	Allied Fisheries N.Z. Ltd.	1979	Squid Jigging
	Taiyo	Amaltal Taiyo Fishery Co., Ltd.	1985	Trawling
	Taiyo	Wattie Taiyo Fishery Co., Ltd.	1986	Trawling
	Kanai Gyogyo	Southfish Kanai Developments Ltd.	1989	Trawling
	Kanai Gyogyo	Hoki and Surimi Joint Venture Ltd.	1989	Trawling
	Kanai Gyogyo	Aurora Fisheries Ltd.	1990	Trawling
	Nikkatsuren	New Zealand Japan Tuna Co. Ltd.	1989	Tuna Fisheries
Senegal	Taiyo	Senepesca Ltd.	1973	Trawling, Refrigeration
Ghana	Wakashio Suisan	Ghana Tuna Fishing Development Co., Ltd.	1973	Skipjack pole-and-line, skipjack seining
Mozambique	Taiyo	Entre Posto Frigorifico De Pesca De Mozambiques, Ltd.	1978	Shrimp trawling, Lobster fishing
Madagascar	Taiyo	Societe Malgache de Pecherie	1966	Shrimp trawling
	Taiyo	Societedes Pecheries do Boina	1982	Shrimp trawling
	Madagascar Unyu Reizosoko	Societe Transprots et Entroposage Frigorifiques De Tantaro	1973	Refrigeration
Mauritius	Kaigai Gyogyo Mitsubishi Shoji	Mauritius Tuna Fishing and Canning Enterprises Ltd.	1970	Tuna seining
Gabon	Showa Ungyo Nissho Iwai	Gafideco	1990	Crab pot fishing

Source: *Suisan Nenkan*, 1992

Appendix XX. -- Japan. Fisheries-related investments in Latin America and Canada.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
Panama	Mitsui Bussan	Mtg Marine Inc	1977	Tuna vessel leasing
	Universal Suisan	Universal Fisheries (Panama) Inc.	1989	Trawler leasing
Mexico	Kosei Shoji	Pesqeria Integral S.A., de C.V.	1979	Tuna longlining*
	Seto Gyogyo (plus 5 other companies)	Explotadora Marina S.A. de C.V.	1979	Sablefish longlining*
Netherlands Antillles	Nichirei	Cracao Pioneering N.V.	1962	Refigeration, Export/Import
Colombia	Konan Suisan Kanematsu Kosho	International Maritima Pesquera Ltd.	1974	Skipjack fishing*
French Guiana	Yutaka Gyogyo	Societe Armement et Marayage de Guyane	1986	Shrimp trawling
Guyana	Yutaka Gyogyo	Guyana Fisheries Ltd.	1974	Refrigeration, Shrimp trawling
Suriname	Nisshin Gyogyo Hakodate Kokai	Surinam Japan Fisheries N.V.	1972	Refrigeration
Peru	New Nippo	Victoria del Mar S.A.	1967	Trawling, Processing*
Chile	Nichiro Mitsubishi	Empresa Pesquera Nichiro Chile, Ltd.	1977	Trawling, Aquaculture
	Nissui Mitsui Bussan	Empresa de Desarrollo Pesquero de Chile	1977	Trawling
	Taiyo	Societe Pesquera Taiyo Chile Ltd.	1977	Trawling
	New Nippo	Frioaysen S.A.	1989	Bottom longlining
Brazil	Nichirei	Industria Brasileira de Pescados Frios S.A.	1960	Canning*
	Nichirei	Companhia de Pesca Norte de Brasil	1960	Shrimp trawling
	Nichirei	Amazonas Industrias Alimenticias S.A.	1978	Processing, freezing
	Santoku Bussan	San Tokuro Piscicultura Ltd.	1974	Eel culture, Sales
	Nichihaku Suisan Shoko	Suisan S.A. Pesca Industria Camercio	1978	Trawling, tuna longlining*
Argentina	Nissui Mitsui Bussan	Exploitacion Pesquera de la Patagonia	1981	Trawling, Fisheries processing
	Nissui	Empresa Pesquera de la Patagonia y Antartida	1988	Trawling
	Sakyu Shoten	Pesquera Sakyu Sociedad Anonima	1986	Trawling, Tuna longlining
	Kaiyo Gyogyo, Kyosui	Pionera S.A.P.N.I.C.E.I Co.	1986	Trawling
	S . A. Marine	Jiggers S.A.	1988	Squid Jigging
Canada	Kibun	North Sea Products Ltd.	1974	Fisheries Processing,
	Kameyama Seikei	Ocean Resources International Company	NA	Kamaboko production*
	Toto Suisan	Tohto Suisan (B.C.), Ltd.	1977	Fisheries processing, purchasing

Source: *Suisan Nenkan*, 1992

Appendix YY. -- Japan. Fisheries-related investments in the United States.

Country	Japanese Investors	Local Company Name	Date of Permission	Company Activities
United States	Taiyo	Western Alaska Fisheries Inc.	1963	Canning, Salmon Roe, Processing
	Taiyo	Alaska Marine Service Inc .	1990	Fisheries Import/Export
	Nissui	Arctic Alaska Fisheries Corp.	1989	Trawling, Surimi processing
	Nichiro Nisshin Kaiyo	Nichiro Pacific Ltd.	1967	Salmon Roe, Canning
	Taiyo	Westward Seafoods Inc.	1989	Surimi Processing
	Marumitsu Shokai	S.A. Packers Inc.	1971	Processing (freezing)
	Marubeni	Togiak Fisheries Inc.	1970	Salmon canning/freezing
	Marubeni	North Pacific Processors Inc.	1972	Salmon canning /freezing
	Marubeni	Bering Sea Fisheries Inc.	1972	Salmon canning/freezing
	Taiyo Marubeni	Alyeska Seafoods Inc.	1985	Processing/freezing
	Watae Shoten	Clipper Seafoods, Ltd.	1987	Lonlinging
	Watae Shoten	Royal King Trawler Inc.	1991	Trawling
	Watae Shoten	Ocean Mist Fisheries Ltd. Partnership	1989	Longlining*
	Marumitsu Tsuda Suisan	Marumitsu Marine Corp.	1971	Sea Urchin processing
	Nakamura Goro	Pacific Marine Products Corp.	1973	Sea Urchin processing
	Nakamura Goro	Pan Marina Products Corp.	1974	Sea Urchin processing
	Nissui Beikoku Mitsui	Morpac Inc.	1973	Salmon canning/freezing
	Kibun	Kibun Corp. of America	1974	Surimi manufacturing
	Nissui	Universal Seafoods Ltd.	1974	Processing/Sales
	Hosui	Northern Seafoods Inc.	1984	Purchasing/processing
	Nichiro	New Wave Fisheries Inc.	1986	Trawling
	Nichiro	Peninsula Salmon Inc.	1979	Salmon fishing
	Nichiro	Seven Seas Fishing Co.	1979	Crab fishing
	Nichiro	Peter Pan Seafoods Inc.	1979	Canning/purchasing
	Nichiro	Sea Blend Food Inc.	1986	Surimi processing
	Kato Suisan Pan Asia Tsusho	Alaskan Bounty Corp.	1980	Processing/seining
	Sasatani Shoten	Homer Seafoods	1976	Processing
	Galaxy International	Oxnara Seafoods Inc.	1977	Surimi processing
	New Nippo	Jubilee Fisheries Inc.	1984	Bottom longlining, sales
	Hoko Suisan	Alaska Ocean Seafood, Ltd.	1988	Trawling
	Hoei Tsusho	Hoei Trading America Inc.	1974	Purchasing/processing
	Toto Suisan	Maruhide Marine Products Inc.	1976	Sea Urchin processing

* - currently inactive

Source: *Suisan Nenkan,* 1992.

Appendix ZZ. -- Japan. Profitability of distant-water fleets, 1987-91.

Vessel Type	Year				
	1987	1988	1989	1990	1991
	Millions of Yen				
Tuna Longliner (200-500GRT)					
Total Revenue	371	385	441	429	365
Labor Cost	142	153	158	167	141
Fuel Cost	42	37	33	40	44
Total Expenses	368	377	390	427	402
Net Profit	3	8	21	2	-37
Skipjack Pole and Line (200-500GRT)					
Total Revenue	310	325	358	365	322
Labor Cost	125	135	152	151	133
Fuel Cost	48	47	46	52	59
Total Expenses	317	336	358	367	380
Net Profit	-7	-11	0	-2	-58
Trawler (200-500GRT)					
Total Revenue	676	675	386	286	431
Labor Cost	245	241	134	131	154
Fuel Cost	102	102	54	105	106
Total Expenses	743	722	443	429	559
Net Profit	-67	-47	-57	-143	-128

Source: US Embassy, Tokyo, May 28, 1993.

4

Republic of Korea

The Republic of Korea's (ROK) distant-water fishing fleet has shown growth in some sectors during the past few years, but faces an increasingly bleak future. With the advent of international regulation of commercially important high-seas fisheries, the ROK distant-water trawler fleet is losing access to major fishing grounds and may eventually follow the Japanese example of moving away from catch operations to post-harvesting, value-added operations.

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I. Distant-water Fishing Fleets

ROK distant-water fishing began in 1957 when several ROK tuna longliners conducted exploratory fishing in the Indian Ocean. The fleet grew from less than 100 vessels in the early 1960s to a peak of 850 vessels in the late 1970s.[1] Lloyd's of London statistics for the largest ROK fishing vessels (over 500 gross registered tons) indicate a sustained level of fleet expansion between 1982 and 1992 (appendix A). ROK Government statistics indicate that the distant-water fleet decreased to about 650 vessels in the mid-1980s, but there was another surge of growth to nearly 800 vessels by 1989. The fleet has decreased slightly since then to a total of 771 vessels in 1991 (appendix B). With the exception of squid jiggers, the major ROK distant-water fleets have all decreased in size since 1989 (figure 1). Recent information from the Japanese

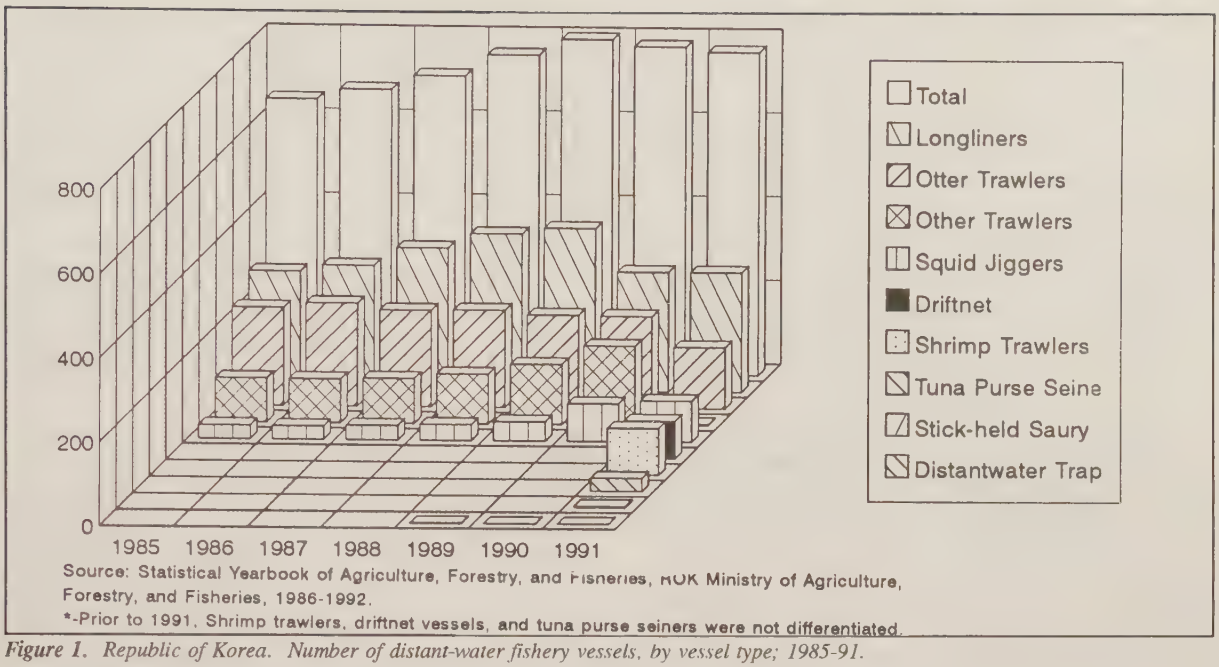

Figure 1. Republic of Korea. Number of distant-water fishery vessels, by vessel type; 1985-91.

fisheries press indicates that the ROK distant-water fleet is shrinking rapidly, from 757 vessels in 1992 to only 645 vessels in 1993.[2]

ROK Government statistics indicate that this is a rapidly aging fleet, particularly for trawlers and jiggers (appendix C). Overall figures indicate that while 22 percent of the ROK distant-water fleet was over 20 years old in 1985, that figure had risen to 35 percent by 1991. The only distant-water fishery that showed a significant number of new vessels is the longlining fishery, where 33 percent of the vessels were 0-5 years old, and only 19 percent were more than 20 years old.

Total ROK catch peaked at 3.6 million metric tons (t) in 1986, and decreased to 3.0 million t in 1991 (appendix D). Distant-water catch has occupied a significant proportion of the total catch, ranging from 25 percent in 1986 to 29 percent in 1991. Distant-water catch peaked at 930,000 t in 1989, but decreased in the two succeeding years to 874,000 t in 1991 (appendix E). Catch decreased from 1990 to 1991 for North Pacific trawlers, squid driftnet vessels, and tuna longliners, but increased for tuna purse seiners and squid jiggers (figure 2). Figures for 1993 indicate that this decreased catch trend is accelerating. ROK distant-water catch decreased 31 percent during January-May 1993 compared to the same time period in 1992.[3] The most important ROK distant-water fisheries in terms of overall catch are trawling, tuna purse seining, squid jigging, and longlining. The only two ROK distant-water fisheries which have shown consistent growth since 1985 are the distant-water tuna purse seine and trawler fisheries located outside of the North Pacific.

A. Trawlers[4]

ROK distant-water trawling began in 1966 when 8 stern trawlers fished in the Atlantic Ocean. In following years, ROK trawlers expanded their operations to the Pacific, Atlantic, and Indian Oceans. Until 1991, the majority of the ROK distant-water trawler catch came from the North Pacific trawl fishery, which targets Alaska pollock in the Central Bering Sea "donut hole," Japanese waters off Hokkaido, the Russian EEZ, and in the central Sea of Okhotsk "peanut hole." ROK distant-water trawlers, fishing outside the North Pacific, target a wide variety of species, squid being the most important. The number of ROK distant-water trawlers decreased gradually from 233 in 1985 to 219 in 1990. Their number decreased dramatically to 146 vessels in 1991, largely because of the poor catch in the donut hole fishery (appendices B and F).

North Pacific Trawlers: Alaska pollock is by far the most important species caught in this fishery. Before the expansion of fishery jurisdictions to 200

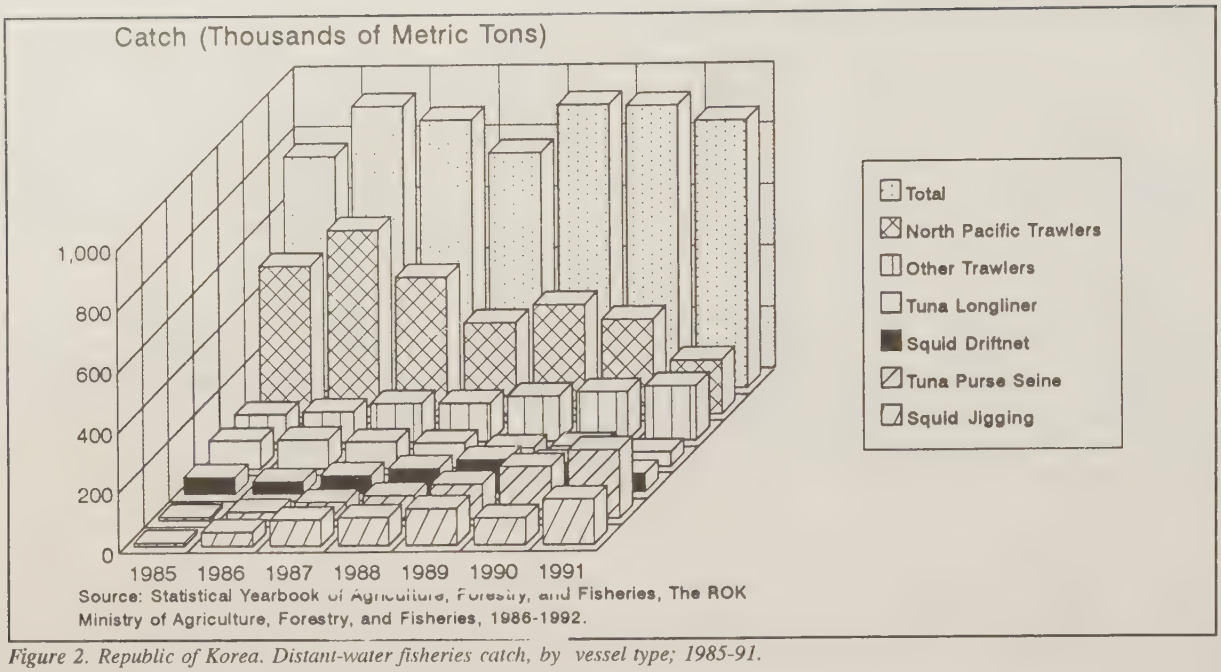

Figure 2. Republic of Korea. Distant-water fisheries catch, by vessel type; 1985-91.

nautical miles and the subsequent establishment of Exclusive Economic Zones (EEZ), the ROK had access to lucrative Alaska pollock fisheries in U.S. and Soviet waters. Even after access was limited for ROK fishermen, the ROK was able to increase total Alaska pollock catches during the late 1970s and early 1980s, with a peak catch of nearly 600,000 t in 1986. Beginning in 1985, however, directed fishing allocations for the ROK within the U.S. EEZ were sharply reduced and were finally reduced to zero in 1988.

ROK trawlers consequently shifted their effort to the high-seas area of the Central Bering Sea donut hole. The ROK donut hole catch increased from only 13,000 t in 1980 to over 300,000 t in 1989 (appendix F). The dramatic drop in donut hole catches during 1990 and 1991 and a subsequent voluntary moratorium on fishing in the donut hole during 1993/94, caused the ROK North Pacific fleet to shift its effort to Japanese, Russian, and peanut hole waters. In September 1992, the ROK Government announced plans to redeploy the 41-vessel North Pacific ROK trawler fleet by sending 31 vessels to Russian and peanut hole waters, and 10 vessels to waters off Hokkaido, Japan. Under the ROK-Japan fisheries agreement, Japan may not regulate ROK vessels fishing outside Japan's 12-mile territorial waters. The ROK Government has agreed to license only 14 trawlers to fish in this region, but the Japanese Government has been pressing for further reductions.[5]

The Russian Federation's unilateral declaration of a ban on fishing in the peanut hole as of June 15, 1993, prompted the ROK to temporarily withdraw its fleet (reportedly 18 trawlers) from the peanut hole and from the Russian Exclusive Economic Zone in the spring of 1993. As a good faith measure, the ROK offered to reduce its peanut hole catch by 25 percent in 1993, but made clear its intention to resume fishing once that mark was reached. It is unclear whether ROK trawlers have resumed fishing in the peanut hole, but the ROK Government informed Russia in August 1993, that it will allow its trawlers to resume fishing in the peanut hole.[6]

The Japanese fisheries press reports that the ROK North Pacific trawler catch has decreased by nearly 50 percent during the first half of 1993, from 100,000 t in the first half of 1992 to 54,000 t in the first half of 1993. The same press report indicates that only 24 of the 32 ROK vessels licensed to fish in this region are actually fishing. The remaining vessels are reportedly tied up in Pusan.[7]

North Atlantic Trawlers: Four ROK trawlers have been fishing in North Atlantic high-seas waters, just outside the Canadian EEZ off the coast of Newfoundland. According to the ROK Government,

the fleet targeted redfish rather than cod, which is the species most often targeted by fishing fleets in the North Atlantic. The Canadian Government has sought the cessation of foreign fishing in this region because of the depleted Canadian cod resource and has requested the withdrawal of ROK vessels from this fishery since 1988.[8] The ROK announced in February 1993 that it would comply with Canada's request and withdraw the four trawlers from the region by the end of April 1993. The ROK Government did not reveal how it would compensate its fishermen for this lost fishing ground.[9]

Southern Trawlers: Other ROK distant-water trawlers primarily target squid which are caught in the southwestern Atlantic and off New Zealand. The trawler-caught squid catch increased from 39,000 t in 1990 to nearly 60,000 t in 1991 (appendix G). There are reportedly 44 trawlers fishing in the southwest Atlantic and 9 trawlers fishing off New Zealand.[10] These vessel numbers are consistent with 1991 catch statistics which show a squid catch of 54,000 t in the Atlantic and 5,000 t in the Pacific (appendices H and I).

Shrimp Trawlers: As is the case with Japan, the ROK has a sizable distant-water trawler fleet fishing for shrimp in waters off South America. The only official statistics available for this fleet indicate that there were 112 ROK distant-water shrimp trawlers in 1991 (appendix B). ROK trawlers, based in Suriname and Brazil, have registered annual catches between 1,500 to 4,000 tons.[11]

B. Squid Jiggers

The ROK's squid jigging and driftnet fisheries began simultaneously in the northwest Pacific in 1979. Jigging operations are currently conducted primarily in the southwestern Atlantic, and off New Zealand and in Peruvian waters. ROK Government statistics indicate a slow growth in the fleet from 1985-89, but a near doubling of the fleet size in 1990 (appendix B). A total of 98 ROK squid jiggers were deployed in 1991 with a total catch of 150,000 tons.[12] Catch statistics show that nearly 75 percent of this squid is taken in the Atlantic Ocean. Total jigging catch has fluctuated greatly since 1988, but has ranged between 86,000 and 150,000 tons during the last 5 years (appendix E).

C. Driftnet Vessels

The ROK distant-water high-seas pelagic driftnet fleet began fishing primarily for flying squid in 1979. Most ROK driftnet vessels were converted tuna longliners, 90 percent of which were more than 16 years old.[13] Vessels sizes ranged from 170-500GRT, with an average capacity of 290 gross registered tons. The number of driftnet vessels grew rapidly from 14 in 1980 to 99 by 1983, and then to 130 in 1987. In 1992, the final year of the driftnet fishery, a total of 105 ROK vessels participated.

In the wake of the 1992 United Nations driftnet moratorium, the ROK Government implemented two programs to assist its driftnet fishermen: 1) provision of loans to driftnet vessel owners to encourage conversion to squid jigging and saury fishing, and 2) purchase of obsolete driftnet vessels for scrapping. The ROK Government allocated $50 million for the loan conversion plan (75 vessels) and $10.6 million for the vessel buy-back program (30 vessels) in 1992. The ROK Government conducted exploratory squid jigging on the former North Pacific driftnet fishing grounds during 1992, but meager catch results indicate that this method is not a feasible alternative for that fishing ground.[14]

In a survey of ROK driftnet vessel owners conducted in late 1992, it was discovered that the owners planned to retire 56 of the driftnet vessels, and convert 44 vessels to alternative (unspecified) fishing methods. The fate of the remaining five vessels remains to be determined.[15] It is likely that former driftnetters, now converted to jigging, will focus their effort on Latin American grounds off Argentina, Peru, and Ecuador.[16]

D. Distant-water Tuna Vessels

The ROK distant-water tuna fishery began in 1957 with tuna longlining in the Indian Ocean.[17] ROK distant-water tuna vessels can be divided into two classifications: longliners which fish in the Atlantic, Pacific, and Indian Oceans; and purse seiners which operate in the central western Pacific. At the end of 1991, a total of 285 ROK distant-water tuna vessels were operating; 248 were longliners and 32 purse seiners (appendix B).

Longliners: The ROK tuna longliner fleet consists of longliners based at Pusan, and at foreign ports around the world. The domestic-based longliners target bigeye and yellowfin tuna for the Japanese sashimi market, while the foreign-based fleet focuses on albacore for canning. Data for 1992 supplied by the U.S. Embassy in Seoul indicate there were 195 domestic-based ROK tuna longliners: 178 in the Pacific, 4 in the Indian Ocean, and 13 in the Atlantic Ocean. There were 53 ROK foreign-based longliners; 42 in the Pacific, 5 in the Indian Ocean, and 6 in the Atlantic.[18]

It has been reported in Japan that there was a major shift in effort by ROK longliners from the Indian and Atlantic Oceans to the Pacific Ocean during 1991.[19] This shift is reflected in the most recent statistics from the Indo-Pacific Tuna Programme and the International Convention for the Conservation of Atlantic Tunas which show the ROK Indian Ocean longliner fleet decreased from 112 vessels in 1988 to 77 vessels in 1990, and ROK Atlantic Ocean longliners decreased from 33 in 1989 to 17 in 1990.[20]

The Forum Fisheries Agency believes that there may be as many as 300 ROK longliners active in the Pacific.[21] The Japanese tuna industry press reports that 192 ROK longliners were active in the Pacific as of February 1992 (an increase of 23 percent from the 167 vessels active in 1985), but it is believed that ROK companies own approximately 80 percent of the estimated 200 flag-of-convenience tuna longliners fishing in the western Pacific, so the figure of 300 ROK longliners may be more accurate.[22]

It has also been reported that fishing for albacore by ROK foreign-based longliners in the south Pacific was poor during the 1990/91 season. Combined with low albacore prices, poor unit-of-effort catch results forced the fleet to target bigeye and yellowfin tuna for the Japanese sashimi market. The number of ROK longliners based in Pago Pago, American Samoa (one of the main tuna canning locations in the Pacific), dropped from 25 longliners in 1989 to just 8 vessels in 1991.[23]

The Japanese fisheries press reported in 1990 that the ROK tuna industry had received permission to build 36 tuna longliners. Of this total, 26 were to be exported, and 10 were to be added to the domestic fleet. Oversupply on the Japanese sashimi market and increased competition from Taiwan longliners resulted in weakened interest for increased investment in new ROK tuna longliners. As a result, only 5 of the 26 longliners for export markets and 2 of the 10 longliners for the domestic market were actually built.[24] The situation in 1993 appears to be even more bleak with reports of additional ROK distant-water tuna vessels tied up in the port of Pusan, no longer able to compete with rival fleets, particularly the Taiwan fleet.[25]

Purse Seiners: There were 32 ROK tuna purse seiners active in the central western Pacific during 1991. Purse seining operations take place off the northern coast of Papua New Guinea and the catch is composed primarily of yellowfin tuna with the remainder consisting largely of skipjack. South Pacific Commission data indicates that the ROK purse seining fleet, although smaller in number than the U.S. and Taiwan fleets, was able to catch more fish than any other country in 1991 (243,000 t). The success of the ROK fleet is attributed to efficient at-sea transshipment operations which enable ROK vessels to avoid stopping in local ports and thereby increase the amount of time devoted to catch operations.[26]

With the concentration of distant-water purse seine effort in the central western Pacific, many Pacific Island nations have become concerned about possible overfishing. In October 1992, eight members of the South Pacific Forum Fisheries Agency (FFA) known as the "Nauru Group" (Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tuvalu) signed an agreement which places a limit on the number of distant-water purse seine vessels fishing in the central and western Pacific. The vessels in this fishery mainly target skipjack and yellowfin tuna and account for the majority of catch in the South Pacific. The signatories justified the need for a limit by noting the rapid capitalization of this fishery and its possible detrimental effects on tuna stocks.[27]

As is the case with its Taiwan and Japanese competitors, ROK tuna fleets face an acute shortage of domestic labor. Although Government statistics indicate the number of distant-water fishery workers has been fluctuating since 1986 (appendix K), it is reasonable to assume that a downward trend similar to Japan should take hold since fewer and fewer young Koreans are interested in working in distant-water fishing operations.

II. Government Promotion of Shipbuilding

There is no information available which indicates that the ROK Government is promoting the construction of new fishing vessels.

III. Current Status of Shipbuilding

Construction of new distant-water fishing vessels has been at a standstill in the ROK since 1989 and the ROK Government is expected to suspend its financial support for new vessel construction. Funds originally earmarked for new vessel construction in 1992 (approximately $44 million) were used instead to finance the renovation and upgrading of over 300 coastal and offshore ROK fishing vessels.[28]

IV. Government Regulation of Fleet Size

In 1991, the ROK National Fisheries Administration (NFA) announced new policies in anticipation of full ROK fisheries trade liberalization in 1997. Between 1992 and 2001, the NFA plans to reduce the total tonnage of the ROK coastal and inshore fisheries fleet from the 1991 level of 963,000GRT to less than 900,000 gross registered tons. The reduction will focus on small fishing vessels using small-mesh nets that deplete vital fishery stocks. In addition, the NFA announced plans to reduce fishing fleets operating in the donut hole and in the southwestern Atlantic squid fishing ground near the Falkland Islands. The NFA will compensate affected fishermen for lost revenue and will purchase their vessels and gear. The NFA plans to use the purchased vessels as artificial reefs to enhance stocks in coastal waters. The NFA also established the Foreign Fisheries Development Foundation to explore potential new fishing grounds beyond the ROK 200-mile EEZ.[29]

ROK Government and industry leaders met in April 1993 to discuss long-term strategies and pro-active measures for the ROK distant-water fishing industry. Industry leaders proposed that the Government reduce interest rates, improve licensing procedures for distant-water fishing vessels, actively work to secure distant-water fishing grounds, and reorganize the structure of the distant-water fishery associations.[30]

V. Vessel Exports

Compared to Japan, the ROK has exported only a small number of fishing vessels (appendices L-T). Significant exports of large ROK fishing vessels began only in the late 1980s. Nations most closely associated with flag-of-convenience registry (Panama, Honduras, St. Vincent-Grenadines, Singapore) appear often in these statistics. Japanese fishery industry sources speculate that most flag-of-convenience fishing vessels are aging Japanese-built tuna longliners registered in flag-of-convenience countries by Korean and Taiwan companies. These vessels are believed to focus their operations on catching and freezing tuna for the Japanese sashimi market. ROK exports of fishing vessels to the flag-of-convenience nations noted above show that the ROK exported a total of 43 vessels with an average capacity of 500GRT between 1986 and 1991 (appendix U). It should be noted that no ROK vessels were exported to these 4 countries in 1992. It is not clear why ROK exports of fishing vessels to these flag-of-convenience nations have decreased, but the Japanese tuna industry has been urging the ROK and Taiwan tuna industries to discourage flag-of-convenience registry since a glut of sashimi-grade tuna supplied by flag-of-convenience longliners has depressed the Japanese sashimi market.

VI. Access to Foreign Fishing Grounds[31]

With the termination of access to the waters of many countries, including the United States and Canada, and increasing restrictions on distant-water highseas fisheries, ROK fishermen have focused their attention on the value-added fisheries processing sector and gained access to foreign fisheries through joint ventures, primarily with developing coastal countries. ROK vessels have secured access to 200-mile zones in Argentina, Peru, the Falkland Islands (United Kingdom), Kiribati, the French Pacific Island territories, Papua New Guinea, New Zealand, the Philippines, Mexico, Suriname, Colombia, Sierra Leone, Senegal, Angola, Guinea-Bissau, Saudi Arabia, China, and Russia.

Gaining access to these fisheries has become increasingly expensive. The ROK National Fisheries Administration reports that the ROK paid nearly $94 million in foreign fishery access fees during 1991, a 290 percent increase over such fees paid in 1990. The highest fees were paid to the former Soviet Union ($52.8 million), the United Kingdom ($8.6 million), Papua New Guinea ($7.2 million), and Kiribati ($5.5 million).[32] Information regarding ROK distant-water fleet activity and joint ventures in foreign countries is as follows:

A. Former Soviet Union/Russian Federation

Bilateral Agreement: The ROK and the Russian Federation signed a fisheries agreement in September 1992. Under the agreement, each side is granted access to the others' waters; joint ventures are encouraged in fishing, processing, and aquaculture; and joint resource assessment research will take place. In particular, Russian officials hope for ROK investment in onshore processing and storage facilities projects in exchange for granting ROK vessels access to Russian waters.

The ROK North Pacific trawler fleet received Alaska pollock allocations within the Russian EEZ in 1992 and 1993, but has so far managed only a negligible Alaska pollock catch in Russian waters. ROK vessels were given Alaska pollock allocations in the waters of the disputed Northern Territories in 1992, but the Japanese Government urged the ROK to respect the Japanese claim to the territories, and thus the ROK actually caught very little Alaska pollock in Russian waters during 1992. In 1993, the ROK was given an allocation in the Russian EEZ of 150,000 t, but the inability of the two sides to reach quick agreement on fees has resulted in limited ROK fishing within Russian waters.

Joint Ventures: ROK fishing companies first formed joint ventures with former Soviet companies in 1989 which allowed over-the-side purchases in Russian waters by ROK fishermen. By 1991, as many as 12 ROK companies with 23 vessels were participating in these joint ventures. The Korean captains purchased an estimated 90,000 t of Alaska pollock, up one-half from the 61,000 t purchased in 1990. A total of 25 ROK vessel owners were expected to purchase 110,000 t of Russian fish through these arrangements in 1992.[33] Final results, however, are not available.

The giant ROK multinational corporation Samsung has signed a 3-year contract (August 1991-July 1994) to purchase Russia-origin Alaska pollock from the Russian Sobvryflot company. Samsung plans to process the Alaska pollock in China and Thailand where labor is inexpensive and sell the product in the United States. Samsung will pay Sobvryflot $6 million per year for 8,000 t of Alaska pollock.[34]

Cooperation between the ROK and Russia is also taking place in fisheries science and technology. At a conference held in April 1992, Russia agreed to provide krill processing expertise in exchange for ROK salmon hatchery technology. The two countries also discussed a joint squid jigging survey on the high-seas of the North Pacific to measure the effectiveness of jigging in comparison to the now-banned driftnet method.[35] ROK jiggers reportedly conducted exploratory fishing for squid in the Russian EEZ off the southern Kuril Islands in late 1992.[36] No further information about this fishery is available.

Russian and ROK officials reached agreement on several additional fishery cooperation projects during meetings held in the ROK in March 1993. Joint projects include surveys of the Alaska pollock resource in the peanut hole and cuttlefish resources in the waters of the two countries, research and tests of trawling gear, and the exchange of marine fishery science information and scientists.[37]

The ROK fisheries industry fervently hopes cooperation with Russia will provide a much-needed boost to its distant-water fisheries. Access to Russian waters will be especially vital for those North Pacific trawlers which previously had access to U.S. and donut hole waters. However, future expansion of this relationship has been threatened by the apparently unreasonable price demands and contract terms demanded by Russian joint venture partners. Russia's determination to close the peanut hole to foreign fishing has also deterred cooperation.

B. East Asia

China: China has allowed ROK vessels access to its waters since 1988. A total of 17 ROK vessels caught 2,724 t in 1991, a 58 percent decrease from 1990. Chinese vessels have been observed poaching in ROK waters, but the ROK hopes this problem can be resolved now that the ROK and China have normalized diplomatic relations. The ROK Government sent a fisheries delegation to China in June 1993 to discuss illegal Chinese fishing in ROK waters and explore the possibility of a bilateral fisheries cooperation agreement.[38]

North Korea: The ROK Government formulated a proposal for joint salmon resource development with North Korea during 1991. The proposal included the establishment of a joint salmon hatchery and joint salmon fishing and marketing operations.[39]

C. South/Southeast Asia

India: The ROK tuna fishing company, Tae Eun, has formed a joint venture in India with Fishing Falcons Ltd. of Hyderabad. Equity capital is shared by the Indian promoter, Mr. Sridhar Reddy, Tae Eun Company, the Indian Marine Products Export Development Authority, and the public. The joint venture company operates two ROK-built longliners, the *Vaishnavi I* and the *Vaishnavi II*. Exploratory fishing was conducted in December 1992 with a reported daily catch of 2 to 2.5 t of bigeye and yellowfin tuna per vessel.[40]

Indonesia: ROK fishing vessels have access to Indonesian waters through joint ventures and leasing arrangements with Indonesian companies. The Dongwong Industries Company, a major ROK tuna fishing company, announced in mid-1992 the construction of a tuna canning plant in Sorong, Irian Jaya, Indonesia. The cannery would process all fish caught by the company's tuna fleet operating in the western Pacific. The plant would reportedly be the largest in Indonesia.[41]

Vietnam: A joint venture tuna canning company has been established by the Dongwon Industrial Company in Vietnam. Details are not available, but Dongwon will provide fishing and processing expertise for this venture.[42] Other ROK fishery companies are expected to build plants in Vietnam to take advantage of Vietnamese natural resources and cheap labor.

D. Oceania

Cook Islands/Tuvalu: Agreements with these two South Pacific nations allowed ROK tuna vessels access only at the end of the 1991-92 fishing season.[43] No further information is available.

French Pacific Territories: The ROK-France agreement allowed 125 ROK tuna longliners to catch 6,100 t of tuna in French Polynesian waters during 1992 for a fee of $835,440.[44] This agreement was reportedly not renewed in 1993 when the two sides were unable to resolve differences over the amount of ROK catch to be offloaded at French Pacific ports and the length of time ROK vessels would be required to stay at these ports.[45]

Kiribati: In 1990, The Korean Deep Sea Fisheries Association agreed to pay a $960,000 access fee which would allow 113 ROK longliners to fish in Kiribati waters. ROK companies were required to hire Kiribati crew under this agreement.[46] The agreement was renewed in July 1992, allowing 110 ROK longliners access for a fee of $1.4 million.[47]

Micronesia: The ROK first concluded a fishery access arrangement with Micronesia in 1980. By 1990, a total of 32 ROK purse seiners were licensed to fish in Micronesian waters. These seiners are largely used vessels purchased from Japan, Mexico, and the United States. The ROK fishery access agreement expired in July 1990 and has not been renewed despite numerous negotiations.[48]

New Zealand: The ROK and New Zealand concluded a fisheries agreement in March 1978. ROK vessels were granted direct access to New Zealand waters under this agreement until the introduction of New Zealand's Quota Management System which allows only New Zealand companies and individuals to own fishing quotas. Quota holders may choose to use their own vessels or charter foreign vessels to catch their quota. The bilateral agreement was renewed in 1990, and extends through September 1994.

Under a charter arrangement, a foreign vessel is hired to catch a quantity of fish which is allocated to a New Zealand company under the quota system. The

catch of charter foreign fishing vessels is approximately 60 percent of the entire catch in the New Zealand EEZ. An estimated 100 foreign fishing vessels will be hired under charter arrangements in the 1992/93 fishing year. These vessels come from many countries, including the ROK. New Zealand companies have benefitted greatly from the use of chartered foreign vessels because they have lower operational costs. The chartered vessel catch is composed largely of groundfish species, such as hoki and southern blue whiting, and squid.[49]

Because the entire New Zealand squid quota is now allocated strictly to New Zealand companies, it is difficult to obtain precise information on the number of ROK jiggers being chartered by New Zealand companies. It is clear, however, that there is still a significant number of ROK jiggers active in this fishery.

Papua New Guinea: The ROK-PNG agreement allows ROK tuna vessels access to PNG fishing grounds, calls for the promotion of joint fishery ventures, and provides for the exchange of fisheries experts. In 1991, 35 ROK tuna vessels caught approximately 75,000 t of tuna in PNG waters. During the most recent round of negotiations held in October 1992, the ROK and PNG were unable to reach agreement because the PNG wanted to reduce the number of ROK vessels by 20 percent over the next three years and raise the access fee by 12.2 percent.[50]

E. Africa/Middle East

Mauritania: The ROK originally concluded a fisheries agreement with Mauritania in 1983. The agreement granted 13 ROK vessels an allocation of 50,000 t of fish between 1983-86 for a fee of $3 million.[51] It is unclear whether this agreement remains in force, but there is one fisheries joint venture called COMACOP (Compagnie Mauritano-Coreenne de Peche) which is still in operation.[52]

Oman: ROK trawlers are fishing for demersal species such as hairtail and croaker off the coast of Oman. A total of 8-10 ROK trawlers, 50 meters long, were reportedly fishing off the coast of Oman in June 1993.[53]

Seychelles: ROK tuna longliners have access to Seychelles waters under an individual licensing agreement.[54] The most recent data indicates 88 ROK longliners were licensed in 1990[55], a significant decline from the 1988 figure of 127 ROK longliners.[56]

Yemen: ROK companies reportedly had agreements with Yemen to fish in the Yemeni EEZ, but these agreements have expired because the ROK companies refused to form joint venture companies.[57]

F. Latin America

Argentina: In the southwestern Atlantic, twenty ROK fishing companies are forming joint fishery ventures with an unknown number of Argentine companies. The principal ROK companies involved in these joint ventures are Daerim and Samho while some of the Argentine companies include Harengus, Mellino, and Antártida Pesquera Industrial (API). Over 30 ROK jigging vessels will participate in the joint venture. ROK squid jiggers have been operating in the southwestern Atlantic (off the coast of the Falkland Islands and elsewhere outside the Argentine 200-mile EEZ) for several years. The ROK Government is trying to assist its distant-water fishermen who have difficulty gaining access to fishing grounds by offering special import privileges to foreign joint venture companies involving ROK participation.[58]

Chile: The ROK signed a technical cooperation agreement in 1969 which focused on the fishing industry. Officials agreed in principle during 1975 to conclude a fisheries cooperation agreement which provided for krill trawling off Chile, technical assistance, and joint ventures. The ROK Government has requested, but not received, fishing allocations from the Chilean Government.

Falkland Islands: ROK catch in this area was negligible until 1986 when the total Atlantic squid catch exceeded 50,000 t for the first time (appendix I). Catch has continued to increase and exceeded 175,000 t in 1991. Most of the ROK vessels operating off the Falklands have been fishing under contract with British-Falklands joint ventures.

ROK squid jiggers were represented by an organization called KOSAC (expansion unknown) in access negotiations with the United Kingdom until 1992. In September 1992, a new organization, Southwest Atlantic, was formed to represent the 25 ROK companies involved in this fishery. During the October 1992 access negotiation, Southwest Atlantic

reportedly requested a fee decrease of 20-30 percent because the ROK squid market was depressed.[59] In response to the depressed market, the ROK squid industry reportedly reduced the total number of jiggers deployed in the Falklands from 67 to 65 vessels, and reduced the number of trawlers from 44 to 40 vessels. The fishing seasons would also be shortened for jiggers from 7 months (December to June) to 4 months (February to June), and for trawlers from all year to 6 months (July to January).[60]

Peru: The ROK fisheries industry has recently shown great interest in Peruvian fisheries. The fishery ministers of the ROK and Peru pledged in March 1993 to strengthen fisheries cooperation between the two countries. The ROK requested increased access to Peruvian waters and an installment plan for payment of access fees. Peru reportedly promised to consider these requests in a positive manner. The ROK also requested permission for ROK trawler fishing in previously unexploited Peruvian fisheries and the formation of joint ventures in fisheries processing and shipbuilding.[61]

ROK squid jiggers have been actively fishing in Peruvian waters since 1991. The Peruvian Government allocated a squid quota of 80,000 t in late 1991 to two Peruvian-ROK joint ventures, Peruko (30,000 t) and Pescapeko (50,000 t), which operated a total of 31 trawlers in Peruvian waters.[62] In mid-1992, the Peruvian Government accepted public bids for squid allocations. A total of 20 ROK jiggers were granted an allocation of 45,000 t for a fee of $185 per ton. This fee was more than double the $80 per ton fee which ROK jiggers paid in 1991. The two joint venture companies which reportedly bid for this allocation were Peruko (25,000 t) and Royal Prestige (20,000 t). The ROK Government is reportedly negotiating with Peru to determine terms of access for ROK squid trawlers and to explore the possibility of a bilateral fisheries agreement.[63] The Japanese fisheries press reports that 29 ROK squid jiggers received an allocation of 52,678 tons from Peru in 1993.[64]

Suriname: Most ROK shrimp trawlers operate under the joint venture company, Suriname American Industries Limited (SAIL), a Suriname Government-owned, but independently managed fishing company. SAIL has exclusive contracts with several ROK fishing companies which operate 70 ROK shrimp trawlers. SAIL pays market prices for the shrimp landed by ROK trawlers and exports it mostly to Japan; some is exported to France. The number of ROK shrimp trawlers licensed to fish in Suriname has remained fairly constant, ranging from 85 vessels in 1987 to 89 vessels in 1992. ROK vessels caught an estimated 3,500 t of shrimp in Suriname during 1991;[65] the 1992 catch is not available.

G. North America

United States: Until the late 1980s, the ROK received annual allocations of groundfish (mostly Alaska pollock) in U.S. waters off Alaska. Due to the "Americanization" of the U.S. 200-mile zone, such allocations are now unavailable to ROK fishermen. The ROK was the first country to establish fishery joint ventures with the United States. These joint ventures involved the "over-the-side" purchase of pollock and other groundfish caught by U.S. fishermen and delivered to ROK factory trawlers. With the rapid increase of U.S. processing capacity, such joint ventures have been phased out. The United States and the ROK have a bilateral "Governing International Fishery Agreement," which expires December 31, 1993.

VII. Outlook

The long-range outlook for ROK distant-water fisheries is not a bright one. Increased restrictions on access to foreign and international waters, rising fishing fees, increased labor costs, decreasing commodity prices, labor shortages, obsolete fishing vessels, and a liberalized fisheries market have all played a role in making distant-water operations increasingly unprofitable. Financial difficulties for Samho Moolsan, one of the ROK's leading distant-water fishery companies, have resulted in bankruptcy and court management of the company. An additional 30-50 small ROK fishery companies have gone bankrupt since the late 1980s. The ROK fisheries industry has requested $125 million in Government assistance, and the Government has agreed to provide $25 million from a special emergency account. The fisheries industry has also requested permission to hire cheap labor from Southeast Asia and ethnic Koreans from China, but it is doubtful that even these measures will be able to stem the seemingly inevitable swing away from distant-water fisheries.[66]

A. Trawlers

With the demise of the donut hole fishery, ROK distant-water trawlers are finding it difficult to locate new fisheries which are profitable. International political pressure is making future access to the peanut hole and Northwest Atlantic fisheries problematic. In addition, rising access fees and nationalization programs are also hurting the ROK trawling sector. The ROK trawler fleet will probably focus on joint ventures with companies in South America, such as Argentina and Chile, where resources are still abundant and labor is relatively cheap.

B. Squid Jiggers

ROK squid jiggers will probably continue to be active in fisheries off New Zealand and the Falkland Islands, but it is clear that they are beginning to heavily fish new grounds off Argentina, Peru, and Ecuador. This trend toward utilizing new grounds off South America should continue, and it would be no surprise if the ROK followed Japan's lead and started exploring jigging off Brazil. It is doubtful that there will be long-term expansion of this fleet, but a good number of former driftnet vessels are expected to join the jigging fleet operating off South America.

C. Driftnet Vessels

As mentioned above, a good proportion of former ROK driftnet vessels are expected to convert to squid jigging. At least half the former driftnet vessel owners are expected to apply for Government compensation and retire their vessels. Many of the driftnet vessels are old and probably could not be profitably converted to any other fishing method.

D. Distant-water Tuna Vessels

Longliners: ROK distant-water tuna longliners face increasingly severe competition from developing counterparts (e.g. China, Indonesia) which, with the help of Taiwan, can deliver sashimi-grade tuna to Japan at a much lower price. It is therefore doubtful that there will be further expansion of the ROK longliner fleet. The remaining ROK tuna longliners will probably continue to focus on Pacific operations since distant-water operations in the Atlantic and Indian Oceans entail considerable labor and fuel costs.

Purse Seiners: Future expansion in this sector will probably be limited to the central Pacific purse seine fleet which has grown steadily over the past few years. Growth in this fleet is threatened, however, by increasingly strict regulation of purse seine activities by the South Pacific Forum Fisheries Agency. Stringent regulation could result in a shift in ROK purse seine effort from the central Pacific to the Indian Ocean.

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60. *Nikkan Suisan Keizai Shinbun*, August 3, 1992.

61. *Nikkan Suisan Keizai Shinbun*, April 1, 1993.

62. *Infofish Trade News*, 15 January 1992.

63. U.S. Embassy, Lima, October 21, 1992; *Nikkan Suisan Keizai Shinbun* , July 20, 1992.

64. *Nikkan Suisan Keizai Shinbun*, April 26, 1993.

65. U.S. Embassy, Paramaribo, June 30, 1993.

66. U.S. Embassy, Seoul, *op.cit.*

Appendices

Appendix A. ROK distant-water fishing vessels, ranked by tonnage: 1975-92.

Year	Gross Registered Tons (GRT)			Total
	500-999	1,000-1,999	Over 2,000	
	Number of vessels			
1975	33	13	10	56
1976	32	11	12	55
1977	29	12	12	53
1978	29	13	13	55
1979	34	14	14	62
1980	33	15	15	63
1981	32	18	12	62
1982	33	19	14	66
1983	40	21	14	75
1984	42	21	14	77
1985	45	21	15	81
1986	47	21	16	84
1987	59	21	17	97
1988	64	21	16	101
1989	67	27	18	112
1990	63	33	18	114
1991	63	35	18	116
1992	72	34	19	125

Source: *Lloyd's Register of Shipping Statistical Tables*, London, UK, various years.

Appendix B. ROK. Distant-water fishing vessels, by number and gross registered tonnage; 1985-91.

Vessel Type	1985		1986		1987		1988		1989		1990		1991	
	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT
Number of Vessels/Tonnage (thousands)														
Longliners	280	99	295	106	338	126	373	139	387	146	285	107	285	107
Otter Trawlers	233	132	245	141	230	140	231	146	221	149	219	178	146	167
Squid Jiggers	33	12	32	12	35	13	38	14	46	17	90	40	98	44
Distantwater Trap	-	-	-	-	-	-	-	-	2	0.2	1	neg	1	neg
Shrimp Trawlers	na	na	na	na	na	na	na	na	na	na	na	na	112	18
Driftnet	na	na	na	na	na	na	na	na	na	na	na	na	90	28
Tuna Purse Seine	na	na	na	na	na	na	na	na	na	na	na	na	32	34
Stick-held Saury	na	na	na	na	na	na	na	na	na	na	na	na	4	2
Others	105	97	104	98	107	99	119	106	143	122	188	81	3	2
Total	651	340	676	357	710	378	761	407	799	434	783	406	771	401

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, ROK Ministry of Agriculture, Forestry, and Fisheries, 1986-92.

Appendix C. ROK. Number of distant-water fishing vessels, by type of vessel and age; 1985-91.

Vessel Type	1985	1986	1987	1988	1989	1990	1991
Number of fishing vessels							
Longliners							
0-5 Years	23	21	54	81	92	98	94
6-10 Years	34	40	45	44	28	17	10
11-15 Years	83	98	103	108	105	44	48
16-20 Years	68	55	46	30	53	71	78
Over 20 years	72	81	90	110	109	55	55
Otter Trawlers							
0-5 Years	1	1	1	2	5	4	4
6-10 Years	76	38	1	3	4	2	2
11-15 Years	88	134	150	133	111	53	4
16-20 Years	60	60	51	47	48	102	80
Over 20 Years	8	12	27	46	53	58	56
Squid Jiggers							
0-5 Years	3	4	6	9	12	12	18
6-10 Years	5	-	-	-	5	6	6
11-15 Years	6	10	11	11	10	16	6
16-20 Years	9	9	9	6	7	30	38
Over 20 Years	10	9	9	12	12	26	30
Shrimp Trawlers							
0-5 Years	na	na	na	na	na	na	1
6-10 Years	na	na	na	na	na	na	2
11-15 Years	na	na	na	na	na	na	16
16-20 Years	na	na	na	na	na	na	49
Over 20 Years	na	na	na	na	na	na	44

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix C (continued). ROK. Number of distant-water fishing vessels, by type of vessel and age; 1985-91.

Vessel Type	1985	1986	1987	1988	1989	1990	1991
Number of fishing vessels							
Driftnet Vessels							
0-5 Years	na	na	na	na	na	na	-
6-10 Years	na	na	na	na	na	na	-
11-15 Years	na	na	na	na	na	na	-
16-20 Years	na	na	na	na	na	na	11
Over 20 years	na	na	na	na	na	na	79
Purse Seiners							
0-5 Years	na	na	na	na	na	na	3
6-10 Years	na	na	na	na	na	na	12
11-15 Years	na	na	na	na	na	na	6
16-20 Years	na	na	na	na	na	na	11
Over 20 Years	na	na	na	na	na	na	-
Other							
0-5 Years	2	3	-	2	3	10	4
6-10 Years	5	1	4	8	12	15	-
11-15 Years	23	22	15	15	16	15	-
16-20 Years	25	24	27	20	23	25	1
Over 20 Years	50	54	61	74	91	124	3
Total							
0-5 Years	29	29	61	94	112	124	124
6-10 Years	120	79	50	55	49	40	32
11-15 Years	200	264	279	267	242	128	80
16-20 Years	162	148	133	103	131	228	268
Over 20 Years	140	156	187	242	265	263	267

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix D. ROK. Fisheries catch, by type of fishery; 1980, 1985-91.

Type of Fishery	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Marine Fisheries								
Distant-water	458,209	767,030	929,886	882,660	774,240	930,333	925,331	873,465
Coastal	1,370,324	1,494,514	1,725,820	1,525,999	1,512,481	1,510,262	1,542,013	1,303,913
Whaling	2,023	426	-	-	-	-	-	-
Mariculture	540,564	787,571	946,965	966,063	886,605	848,246	772,731	775,419
Total Marine	2,371,120	3,049,541	3,602,671	3,274,722	3,173,326	3,288,841	3,240,075	2,952,797
Freshwater Fisheries								
Wild catch	38,232	50,400	51,779	47,598	24,681	18,958	18,594	16,167
Freshwater culture	994	2,664	5,274	9,505	11,128	11,596	15,837	14,258
Total Freshwater	39,226	53,064	57,053	57,103	35,809	30,554	34,431	30,425
Grand Total	2,410,346	3,102,605	3,569,724	3,331,825	3,209,135	3,319,395	3,274,506	2,983,222

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix E. ROK. Distant-water fisheries catch, by type of vessel, species, and fishing area, 1985-91.

Vessel Type	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
Tuna							
Longliner-Foreign Base	30,034	30,071	18,411	17,311	15,851	16,011	7,060
Longliner-Home Port	63,056	65,330	69,026	64,415	48,362	53,513	40,014
Skipjack Jigging	260	268	-	-	-	-	-
Purse Seine	11,279	27,732	58,752	79,397	115,754	173,343	227,518
Albacore Driftnet	-	-	-	342	950	384	295
Total Tuna	104,629	123,401	146,189	161,465	180,917	243,251	274,887
Squid Jigging	11,809	45,917	86,311	92,359	120,854	88,843	150,039
Squid Driftnet	58,623	43,028	62,852	83,925	112,223	99,203	62,617
Trawlers							
North Pacific	494,455	610,274	454,492	304,343	362,099	312,218	177,400
Other Areas	93,653	101,538	127,902	126,855	149,142	161,650	179,773
Shrimp	2,088	2,743	3,471	2,821	1,786	1,836	1,587
Total Trawler	590,196	714,555	585,865	434,019	513,027	475,704	358,760
Others	2,199	2,920	1,440	2,472	3,312	18,050	27,162
Total	767,030	929,886	882,660	774,240	930,333	925,331	873,465

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix F. ROK. Annual Catch and fleet size in the Central Bering Sea "donut hole" region, 1980-91.

Year	Number of Vessels	Catch
1980	-	13,000 t
1981	-	-
1982	5	3,000 t
1983	25	67,000 t
1984	26	80,000 t
1985	26	82,000 t
1986	30	158,000 t
1987	32	242,000 t
1988	33	269,000 t
1989	41	342,000 t
1990	41	244,000 t
1991	41	78,000 t

Source: "Recent Korean Walleye Pollock Fishery in the Central Bering Sea," ROK National Fisheries Research and Development Agency, 1991.

Appendix G. ROK. Distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
				Metric tons			
Tuna Longliner-Foreign Base							
Bluefin Tuna	-	-	-	6	-	26	-
Yellowfin Tuna	3,409	2,526	2,966	3,303	3,375	3,577	1,809
Albacore Tuna	16,818	18,979	8,856	6,869	4,447	2,987	1,325
Bigeye Tuna	2,696	2,170	2,741	4,035	5,077	5,825	2,108
Other	7,111	6,396	3,848	3,098	2,952	3,596	1,818
Tuna Longliner-Home Port							
Bluefin Tuna	77	-	43	-	-	57	94
Yellowfin Tuna	22,091	24,963	22,890	22,915	15,547	18,128	12,119
Albacore Tuna	843	548	412	444	210	330	238
Bigeye Tuna	31,314	31,238	34,693	31,074	25,625	27,991	21,158
Other	8,731	8,491	10,988	9,968	6,980	7,007	6,405
Tuna Purse Seine							
Yellowfin Tuna	-	2,427	17,383	14,560	34,532	34,765	55,416
Skipjack	11,279	23,305	40,918	64,032	80,903	138,460	171,951
Other	-	-	451	805	319	118	151
Albacore Driftnet							
Albacore Tuna	-	-	-	327	921	375	231
Others	-	-	-	15	29	9	64
Squid Jigging							
Squid	11,699	45,455	85,495	92,342	120,854	88,693	148,477
Cuttlefish	110	457	816	-	-	-	573
Other	-	5	-	17	-	-	989
Driftnet							
Squid	58,442	42,983	62,846	83,829	112,190	98,441	62,349
Cuttlefish	170	-	-	68	-	735	249
Other	11	45	6	28	33	27	19

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix G (continued). ROK. Distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
North Pacific Trawlers							
Alaska Pollock	404,809	539,592	410,280	299,565	359,472	308,689	177,365
Flounder	48,688	32,258	32,109	1,642	124	696	13
Squid	4,178	10,712	6,566	1,639	2,347	2,753	17
Other	36,780	27,712	5,537	1,497	156	80	5
Other Trawlers							
Alaska Pollock	-	20	345	-	1,705	3,014	4
Flounder	8,128	7,561	7,066	5,947	3,480	4,304	2,087
Sea Bream	12,770	11,918	17,168	11,813	7,931	12,210	11,565
Pacific Ocean Perch	12	281	10,483	7,856	28,760	22,086	17,464
Skates/Rays	494	353	1,190	6,503	7,587	3,778	3,199
Croaker	2,047	1,237	1,063	4,529	5,193	5,649	8,706
Hairtail	4,837	5,736	4,543	9,195	6,780	8,430	10,139
Shrimp	173	217	1,615	500	2,443	4,494	-
Squid	8,614	9,704	17,313	19,383	33,670	39,075	59,813
Cuttlefish	11,411	9,969	6,788	3,107	3,398	3,573	9,927
Octopus	9,492	12,559	6,548	3,264	3,624	2,984	1,154
Other	35,675	41,983	53,780	54,758	44,571	52,053	55,715
Shrimp Trawl							
Shrimp	2,088	2,578	3,549	2,710	1,685	1,836	1,583
Other	-	165	15	111	101	-	4
Shark Driftnet							
Sharks	723	585	330	24	-	280	14
Other	-	-	9	-	-	-	-
Saury Liftnet							
Saury	-	-	-	-	3,236	17,762	25,135
Others	1,310	2,668	1,101	488	-	438	2,013
Total	767,030	929,886	882,660	774,240	930,333	925,331	873,465

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix H. ROK. Pacific distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
Tuna Longliner-Foreign Base							
Bluefin Tuna	-	-	-	6	-	26	-
Yellowfin Tuna	1,826	1,647	1,877	1,233	983	1,752	696
Albacore Tuna	16,177	18,359	8,384	6,610	4,306	2,911	1,293
Bigeye Tuna	984	894	1,652	1,076	872	2,033	1,006
Other	6,546	5,935	3,287	2,152	1,619	2,564	703
Tuna Longliner-Home Port							
Bluefin Tuna	-	-	43	-	-	57	94
Yellowfin Tuna	8,418	9,133	9,947	10,189	7,301	12,139	9,968
Albacore Tuna	259	303	262	391	189	321	238
Bigeye Tuna	9,897	15,033	17,482	12,605	10,236	18,780	19,335
Other	2,994	3,446	5,260	5,135	2,560	4,179	5,418
Tuna Purse Seine							
Yellowfin Tuna	-	2,427	17,383	14,560	34,532	34,765	55,416
Skipjack	11,279	23,305	40,918	63,964	80,903	138,460	171,951
Other	-	-	451	-	319	118	151
Squid Jigging							
Squid	2,777	2,018	5,435	5,701	7,801	7,382	24,564
Cuttlefish	-	-	-	-	-	-	573
Other	-	5	-	-	-	150	901
Driftnet							
Squid	58,442	42,983	62,846	83,419	112,190	98,441	62,349
Cuttlefish	170	-	-	68	-	735	249
Other	11	45	6	28	33	67	19

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix H (continued). ROK. Pacific distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
North Pacific Trawlers							
Alaska Pollock	404,809	539,592	410,280	299,565	359,472	308,689	177,365
Flounder	48,688	32,258	32,109	1,642	124	696	13
Squid	4,178	10,712	6,566	1,639	2,347	2,753	17
Other	36,780	27,712	5,537	1,497	156	80	5
Other Trawlers							
Alaska Pollock	-	-	345	-	1,705	3,009	-
Sea Bream	1,783	1,288	1,865	5,169	2,457	4,710	3,950
Croaker	-	-	5	2,240	2,610	2,793	5,608
Hairtail	19	11	94	3,311	1,848	1,213	1,800
Shrimp	-	-	-	-	-	4,494	-
Squid	3,939	3,061	5,166	4,637	8,765	8,391	4,935
Octopus	1	24	20	84	112	1,844	265
Other	16,004	11,716	14,927	27,737	27,533	21,890	22,810
Shark Driftnet							
Sharks	175	106	-	-	-	280	14
Saury Liftnet							
Saury	-	-	-	-	3,236	17,762	25,135
Others	1,310	2,638	1,016	487	-	384	1,201
Total	637,216	756,651	653,163	557,183	674,905	703,678	598,042

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix I. ROK. Atlantic Ocean distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
Tuna Longliner-Foreign Base							
Bluefin Tuna	-	-	-	-	-	-	-
Yellowfin Tuna	1,394	865	928	459	798	340	164
Albacore Tuna	641	589	381	197	107	53	32
Bigeye Tuna	1,496	1,221	930	919	1,776	1,407	463
Other	531	457	447	341	632	374	762
Tuna Longliner-Home Port							
Bluefin Tuna	77	-	-	-	-	-	-
Yellowfin Tuna	1,845	953	529	909	1,737	468	96
Albacore Tuna	-	-	-	-	-	-	-
Bigeye Tuna	9,195	4,863	3,508	4,000	6,120	1,283	38
Other	2,625	1,064	1,616	1,035	1,367	470	587
Squid Jigging							
Squid	7,018	43,215	79,741	86,641	113,053	81,311	123,913
Cuttlefish	110	457	816	-	-	-	-
Other Trawlers							
Flounder	8,128	7,561	7,048	5,947	-	4,304	2,087
Sea Bream	6,661	4,412	6,144	2,074	2,457	1,011	1,338
Perch	12	274	10,465	7,783	28,760	22,061	17,458
Shrimp	170	217	1,615	500	2,334	4,491	360
Squid	4,675	6,643	12,147	14,743	24,905	30,418	54,381
Cuttlefish	9,608	8,202	4,822	2,415	2,530	1,803	9,057
Octopus	9,491	12,535	6,526	3,180	3,512	1,140	889
Other	16,002	20,713	33,304	25,445	21,409	19,501	24,452
Shrimp Trawl							
Shrimp	2,088	2,522	2,495	2,038	1,355	1,357	1,173
Others	548	-	339	1,307	-	54	567
Total	82,565	117,242	173,801	159,933	212,852	171,846	238,909

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix J. ROK. Indian Ocean distant-water fisheries catch, by fishery and species; 1985-91.

Fishery/Species	1985	1986	1987	1988	1989	1990	1991
			Metric tons				
Tuna Longliner-Foreign Base							
Bluefin Tuna	-	-	-	-	-	-	-
Yellowfin Tuna	189	14	161	1,611	1,594	1,485	949
Albacore Tuna	-	31	91	62	34	23	-
Bigeye Tuna	216	55	159	2,040	2,429	2,385	639
Other	34	4	114	605	701	658	353
Tuna Longliner-Home Port							
Bluefin Tuna	-	-	-	-	-	-	-
Yellowfin Tuna	11,828	14,877	12,414	11,817	6,509	5,521	2,055
Albacore Tuna	324	140	130	53	21	9	-
Bigeye Tuna	12,222	11,342	13,703	14,469	9,269	7,928	1,485
Other	3,372	4,176	4,132	3,812	3,053	2,358	700
Albacore Driftnet							
Albacore Tuna	-	-	-	299	420	384	231
Bigeye Tuna	-	-	-	5	-	6	31
Other	-	-	-	10	-	3	33
Other Trawlers							
Sea Bream	4,326	6,218	9,159	4,570	3,525	6,489	6,277
Croaker	1,331	1,073	508	1,319	1,600	1,890	1,933
Hairtail	4,790	5,180	4,449	5,884	4,919	7,216	8,295
Squid	-	-	-	3	-	266	497
Cuttlefish	1,803	1,731	1,966	692	868	1,770	870
Other	4,910	10,679	7,327	9,122	7,203	10,946	11,511
Shrimp Trawl							
Shrimp	-	56	964	664	330	479	410
Other	-	165	15	69	-	-	-
Others	-	-	-	1	-	-	-
Total	47,249	55,993	55,696	57,124	42,576	49,807	36,514

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1986-1992.

Appendix K. ROK. Fishery labor force, by age; 1980, 1985-91.

Fishery Workers	1980	1985	1986	1987	1988	1989	1990	1991
				Number of workers				
Fishery Workers	323,166	260,326	259,747	255,162	248,635	238,534	211,753	204,596
Members per household	2.06	1.79	1.81	1.81	1.80	1.78	1.74	1.71
Crew in distantwater fisheries	15,550	13,789	16,178	19,102	19,987	20,924	21,709	20,509
Fishery workers, by age								
14-19 years old	na	3,984	3,648	3,203	2,808	1,946	1,499	1,428
20-29 years old	na	38,152	35,680	34,765	30,451	24,401	21,134	16,908
30-39 years old	na	52,051	51,856	56,143	54,569	51,550	47,019	44,757
40-49 years old	na	68,693	67,628	72,460	69,579	67,606	57,841	54,079
50-59 years old	na	50,428	53,445	60,991	63,005	63,352	57,018	58,186
Over 60 years old	na	23,329	24,699	27,600	28,223	29,679	27,242	29,238

Source: *Statistical Yearbook of Agriculture, Forestry, and Fisheries*, Ministry of Agriculture, Forestry, and Fisheries, 1981, 1986-1992.

Appendix L. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1980.

Country	Number Exported	Total GRT	Total FOB $Value (millions)
Kenya	2	500	3.2
Bangladesh	2	240	1.3
Panama	1	499	1.6
U.S.A	1	297	0.1
Ghana	1	246	0.05
Spain	1	-	0.2
Grand Total	8	1,782	6.5

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix M. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1985.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Syria	4	708	3.3
Maldives	1	850	2.1
Grand Total	5	1,558	5.4

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix N. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1986.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Philippines	6	425	2.3
India	4	544	2.6
Honduras	1	311	0.06
Grand Total	11	1,280	4.9

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix O. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1987.

Country	Number Exported	Total GRT	Total FOB $Value (millions)
U.S.A	10	1,765*	3.0
Sweden	2	478	2.6
Panama	1	1,652	0.4
Honduras	1	377	2.1
Grand Total	14	4,272	8.1

*This total only includes 2 of the U.S. vessels. The GRT for the other 8 vessels is not available.
Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix P. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1988.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Panama	2	5,624*	0.08
Honduras	2	832	5.3
Spain	2	760	4.1
India	2	155	1.3
Norway	1	40,396	0.6
Japan	1	3,037	0.3
New Zealand	1	180	1.3
Grand Total	11	50,984	13.0

* - This figure includes only one of the two vessels exported to Panama in 1988.
Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix Q. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1989.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Panama	5	2,679	18.1
Honduras	5	2,058	15.3
Spain	3	306	2.5
Singapore	3	306	2.5
Indonesia	2	419	1.1
India	2	358	1.5
Japan	1	600	0.01
Nigeria	1	179	0.8
Argentina	NA	NA	0.3
Other Countries	10	11,688	22.1
Grand Total	32	18,593	64.2

*NA- Not available
Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix R. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1990.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Libya	10	1,734	16.5
St. Vincent-Grenadines	9	2,436	18.6
Panama	6	2,416	19.1
Honduras	3	1,494	13.8
Japan	2	1,610	0.3
Philippines	1	920	1.0
Sierra Leone	1	325	0.01
Singapore	1	305	0.2
Other Countries	2	899	7.0
Grand Total	35	12,139	76.6

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix S. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1991.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Libya	10	1,139	16.5
U.S.S.R	5	8,420	1.0
Honduras	2	832	6.9
St. Vincent-Grenadines	2	168	2.0
Liberia	1	17,126	0.1
Grand Total	20	27,685	26.5

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix T. ROK. Exports of Fishing and Fish Processing Vessels Made of Steel, 1992.

Country	Number Exported	Total GRT	Total FOB $ Value (Millions)
Libya	5	272	8.3
Japan	2	1,475	1.5
Greece	1	10,016	0.2
U.S.A	1	160	0.03
Other Countries	2	3,777	0.6
Grand Total	11	15,300	10.5

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

Appendix U. ROK. Exports of fishing vessels to flag-of-convenience nations.

Year		Panama	Honduras	St. Vincent	Singapore
Number of vessels/Gross registered tonnage					
1985	No	-	-	-	-
	GRT	-	-	-	-
1986	No	-	1	-	-
	GRT	-	311	-	-
1987	No	1	1	-	-
	GRT	1,652	377	-	-
1988	No	2	2	-	-
	GRT	5,624	832	-	-
1989	No	5	5	-	3
	GRT	2,679	2,058	-	306
1990	No	6	3	9	1
	GRT	2,416	1,494	2,436	305
1991	No	-	2	2	-
	GRT	-	832	168	-
1992	No	-	-	-	-
	GRT	-	-	-	-
Total	No	14	14	11	4
	GRT	12,371	5,904	2,604	609
	Avg. GRT	884	422	237	152

Source: *Statistical Yearbook of Foreign Trade*, Korean Customs Administration, Korea Customs Research Institute.

5

Taiwan

The Taiwan distant-water fishing industry, like most primary industry sectors in Taiwan, is in apparent decline. The fishing industry was at one time a model for economic development in Taiwan. This is hardly the case now, as Taiwan officials pursue policies which promote development of high-tech economic sectors, while providing compensation to those who forsake traditional occupations such as fishing.

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I. Distant-water Fishing Fleets

Data from Lloyd's of London and Taiwan officials indicate that the majority of the Taiwan distant-water fishing vessels have less than 500 gross registered tons (GRT) (appendices A and C). Taiwan official statistics put the number of vessels in the distant-water fleet[1] at approximately 1,800 vessels in 1990, with the 1991 figure standing at 1,600 vessels (appendices B and C).[2] Tuna longliners and trawlers make up the great majority of the fleet, with the remainder consisting of tuna and mackerel purse seiners, squid jiggers, and former driftnet vessels (appendix B, figure 1). Between 1990 and 1991, the number of tuna longliners and trawlers decreased, while the number of squid jigger and tuna purse seiners increased.

The distant-water fishing sector dominates overall Taiwan fisheries catch, largely because coastal and offshore fisheries suffer from severely depleted fishery resources. This is seen in the overall Taiwan catch statistics which show that distant-water fisheries catch

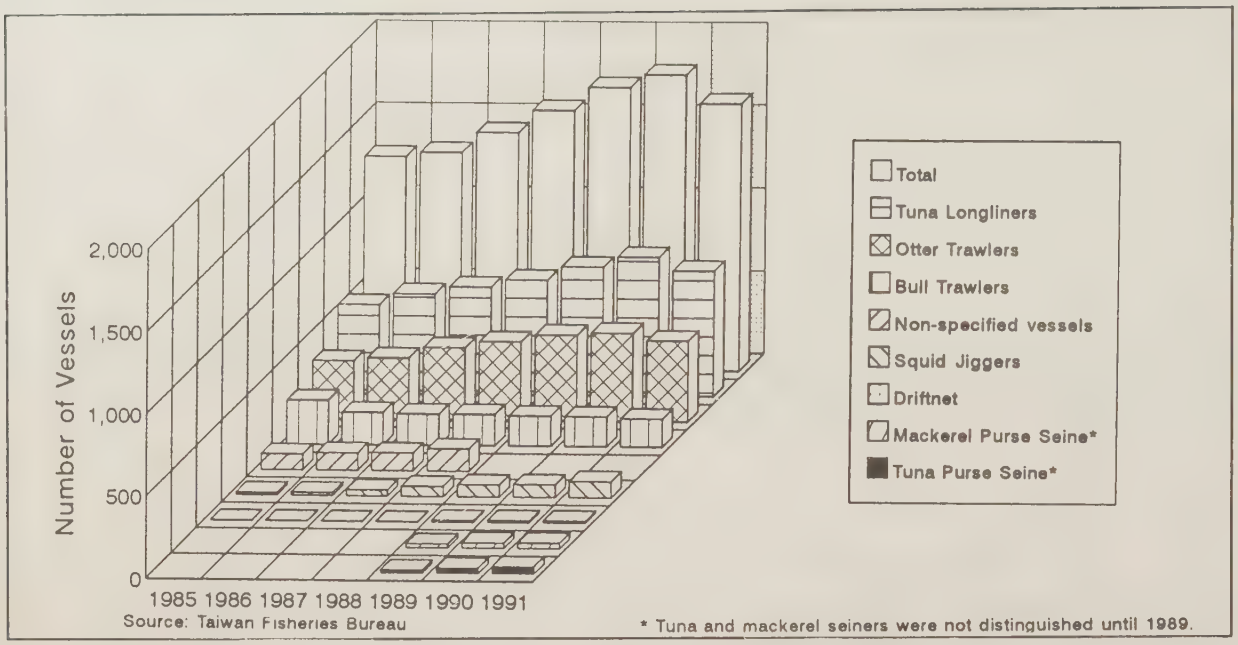

Figure 1. Taiwan. Number of distant-water fishery vessels, by vessel type; 1985-91.

comprised 54 percent of the total Taiwan catch in 1991 (appendix D). Distant-water vessels remain at sea for extended periods of time and sell their catch at foreign ports, or transfer it to transport vessels for worldwide distribution. Taiwan officials spend $1-2 million annually for the operation of 63 foreign fishing supply and transshipment bases for the distant-water fleet.[3]

Taiwan distant-water fleet statistics indicate that the catch peaked in 1990 and decreased slightly in 1991 (appendices E and F). Catch decreased in all sectors except in the squid driftnet and jigging categories (figure 2). The trawler fisheries catch has decreased gradually between 1988-91 while tuna purse seine and longliner catches have fluctuated.

A. Trawlers

Taiwan trawler fisheries were initiated as early as 1925. During the early days, fishing was conducted in the nearby East China, Yellow, and South China Seas by small vessels having 50-80 gross registered tons. Distant-water operations commenced in 1971 with an exploratory fishery off the coast of northern Australia. Taiwan trawlers operated under bilateral access agreements off the coasts of Australia, the Republic of South Africa, Indonesia, India, Pakistan, and Somalia.[4]

At present, most of Taiwan's trawler fleet operates in coastal Taiwan waters using vessels of less than 50 gross registered tons. It was estimated in 1988 that 250 Taiwan trawlers were fishing in distant-water grounds,[5] primarily in Indian and Indonesian waters as access to foreign waters has been eliminated over the years.[6] The bulk of the catch consists of squid, cuttlefish, shark, snapper, and other species largely consumed in the domestic market. Overall catch for Taiwan distant-water trawl fisheries has decreased nearly 30 percent from the peak year of 1988 to 1991 (appendix G). According to one source, there were only 5 Taiwan trawlers greater than 1,000GRT in 1990 and 1991.[7]

B. Squid Jiggers

Squid jigging operations have produced at least half of Taiwan's squid supply since their inception in the early 1970s. Taiwan first conducted exploratory squid jigging off New Zealand in 1972 and in the southwest Atlantic in 1984.[8] Almost the entire Taiwan squid jigging catch is now harvested on the fishing grounds in the southwest Atlantic off the coast of Argentina and within the Falkland Islands EEZ. Taiwan jigging off New Zealand was suspended in 1986, because of "low economic efficiency."[9]

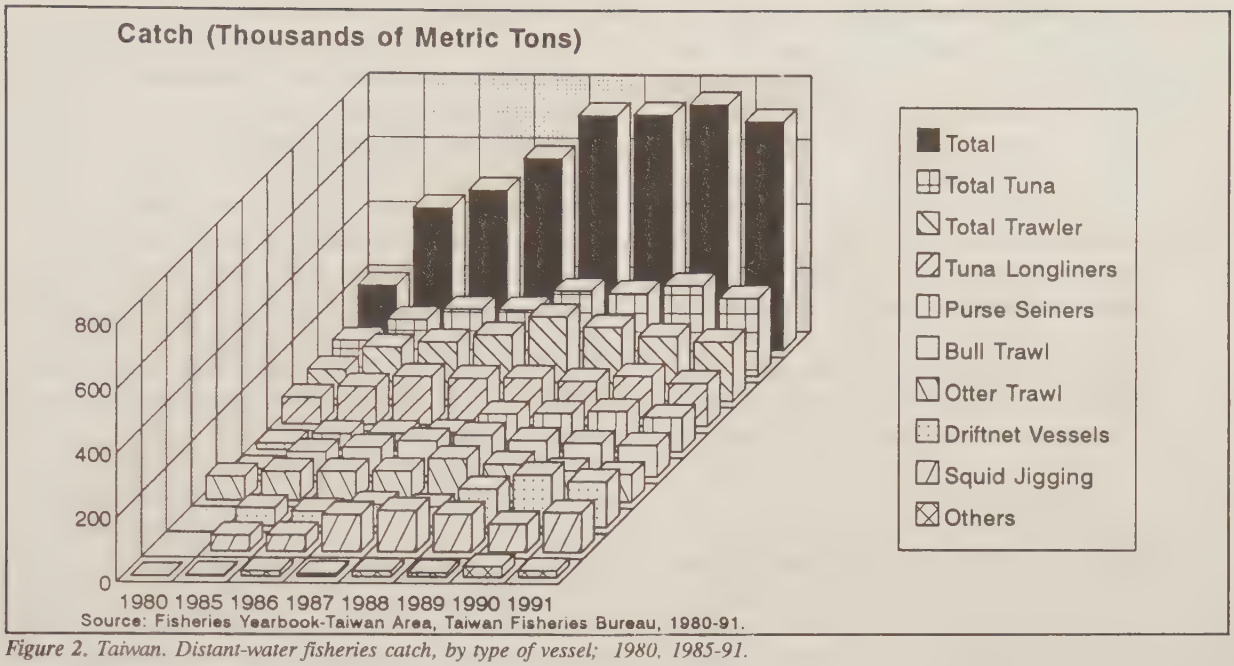

Figure 2. Taiwan. Distant-water fisheries catch, by type of vessel; 1980, 1985-91.

There are varying estimates of the number of Taiwan distant-water squid jiggers. According to Infofish, the number of Taiwan jiggers operating in the southwest Atlantic may be as high as 132, but Taiwan vessel statistics state there were 99 jiggers in 1991 (appendix B). The jigging vessels average 700GRT and are manned by 18-20 person crews. Taiwan jiggers are multi-gear vessels which, until the 1992 driftnet moratorium, fished in the southwest Atlantic from February to June, and then moved to the North Pacific for driftnet fishing. With the driftnet moratorium, these vessels may fish for saury in the southwest Atlantic from June onwards, or move to the Indian Ocean for tuna longlining.

C. Driftnet Vessels

The number of Taiwan driftnet vessels fishing in the North Pacific and Indian Oceans totaled 221 in 1991, and decreased to 95 in 1992, the final year of the driftnet fishery.[10] In addition to squid, these vessels targeted albacore tuna, swordfish, and shark. Squid was the primary target species in the North Pacific fishery conducted between May and October, and highly migratory species were the primary target species in the Indian Ocean fishery conducted between November and March. The smallest Taiwan driftnet vessels were 100-199GRT class, with most driftnet vessels ranging from 200-399 gross registered tons.

Following the United Nations General Assembly (UNGA) Resolution No. 44/225 on large-scale pelagic driftnet fishing, adopted on December 22, 1989, and the follow-up resolution No. 46/215, which established a driftnet fishing moratorium effective January 1, 1993, Taiwan officials took steps to reduce the high-seas driftnet fleet by 50 percent before June 30, 1992, and to impose the UNGA moratorium by December 31, 1992.

In July 1991, Taiwan officials introduced the following measures aimed at reducing the driftnet fleet size and encouraging conversion to alternative fishing methods;

1) priority buy-back of driftnet vessels at $480 per GRT, with a maximum compensation of $200,000 per vessel (1992/93 total budget is $22.3 million),

2) provision of low-interest loans to owners of driftnet vessels less than 15 years old to enable them to covert to alternative fishing methods, with a maximum loan of $200,000 per vessel at an interest rate of 5.25 percent,

3) prior to December 31, 1992, provision for driftnet vessel owners to use their driftnet vessel construction quota for construction of tuna purse seiners having at least 1,000GRT, and

4) creation of a special fund to promote consumption of species caught by alternative fishing methods (e.g. squid, tuna, and saury). Taiwan officials reportedly have bought-back 76 older driftnet vessels which have been used as artificial reefs along the southern coast, and financed gear conversion for 18 vessels, with 54 additional loan applications under review.[11]

In accordance with the UNGA Resolution 46/215, Taiwan licensed 64 North Pacific (half the 1991 total) and 31 Indian Ocean (one-third the 1991 total) driftnet vessels in 1992. Taiwan officials announced on December 9, 1992, that no Taiwan driftnet vessels would be licensed in 1993. As of November 11, 1992, no driftnet vessels were permitted to apply for port clearance for distant-water fisheries. The 64 North Pacific driftnet vessels were required to return to Taiwan for inspection by December 15, 1992. The 31 Indian Ocean vessels were required to cease fishing and return to Taiwan by December 31, 1992, or call at the ports of Singapore and Cape Town, South Africa, for inspection to ensure that driftnet equipment and gear have been dismantled and properly disposed. These vessels may continue fishing by other methods in the Indian Ocean or the southwestern Atlantic only after inspection.

The Japanese tuna industry has been concerned that many former Taiwan driftnet vessels would be converted to tuna longlining, thus exacerbating the continuing problem of oversupply on the Japanese sashimi tuna market. Taiwan has assured Japan that any former driftnet vessels converted to tuna longlining would be older vessels based in Taiwan because of their dated ammonia-freezing technology. Newer driftnet vessels were expected to be converted to squid jigging.[12]

With the advent of the traditional May-September North Pacific driftnet season in 1993, there have been press reports which claim that Taiwan driftnet vessels may still be fishing.[13] However, there have not been any confirmed cases of driftnet fishing by Taiwan-flag vessels during the 1993 season.

D. Distant-water Tuna Vessels

Taiwan distant-water tuna vessels began fishing in the 1960s. Until the mid-1970s, the majority of the catch was exported to the international tuna canning industry. Low prices for canned tuna and the development of ultra-low temperature freezing technology during the mid-1970s provided Taiwan with the impetus to initiate an ultra-low temperature tuna freezing longliner fleet which continues to be Taiwan's most lucrative distant-water tuna fishing fleet. This fleet is capable of catching and storing large amounts of high-quality sashimi-grade tuna for export to the lucrative Japanese sashimi market.[14]

Taiwan distant-water tuna vessels employ two fishing methods: longlining and purse seining.

Longliners: The Taiwan distant-water longlining fleet (larger than 100GRT) increased during the 1980s, peaking at 841 vessels in 1990. Figures for 1991 indicate a decrease to 759 vessels (appendix B). Taiwan longliners fish in the Atlantic, Pacific, and Indian Oceans, with the majority of the catch consisting of albacore tuna. The Taiwan Distant-water Fisheries Association reported in June 1992 the following breakdown for 650 Taiwan distant-water tuna vessels affiliated with the Association: 313 freezer longliners (400-700GRT vessels equipped with super low-temperature freezers for sashimi tuna production), 216 albacore longliners, 46 purse seiners, and 75 driftnet vessels. According to the Association, all Taiwan distant-water longliner owners are members of the Association, indicating Taiwan official figures cited above (759 vessels) may include over 100 tuna longliners engaged in coastal operations.[15]

In the **Atlantic Ocean,** 149 Taiwan longliners fished for tuna in 1990. The number of Taiwan longliners in the Atlantic Ocean has varied between 110 and 150 since 1987 (appendix H). The majority of the longliners are 201-500GRT class vessels with the number of larger longliners (over 500GRT) increasing to an all-time high of 50 in 1990.[16] Approximately 80 of these longliners are actually based in this region, the home ports for the rest remain in Taiwan. Taiwan vessels active in the North Atlantic are based in Las Palmas (Spain), St. Martin (Trinidad), and in St. Lucia, while vessels active in the South Atlantic are based in Cape Town (South Africa), and Montevideo (Uruguay).[17]

In the **Indian Ocean**, the number of Taiwan longliners has more than doubled since the mid-1980s, from 127 vessels in 1985 to 276 vessels in 1990 (appendix H). As is the case in the Atlantic, vessels tend to be of the 200-500GRT class, with a marked increase in the number of over 500GRT vessels in 1989 and 1990.[18] Approximately 25 of these longliners are actually based in this region, operating out of Singapore, Mauritius, and Reunion.[19] The rest of these vessels are presumably based in Taiwan.

In the **Pacific Ocean**, the Taiwan longliner fleet consists of two groups: the smaller (less than 100GRT) vessels, based in the Federated States of Micronesia, Guam, the Republic of the Marshall Islands, Palau, and Taiwan which target bigeye and yellowfin tuna for the Japanese sashimi market; and larger vessels (150-250GRT) based in American Samoa and Fiji, which target albacore for canning.[20]

Purse Seiners: The Taiwan purse seine fleet is comparatively new, having begun its operations in 1981. The fleet, consisting of 1,000GRT vessels, primarily targets yellowfin tuna and skipjack which is transshipped via Guam or on carriers at sea directly to the United States, Japan, or Thailand for canning.[21] The Taiwan purse seine fleet has increased dramatically in size, from zero in 1980 to 46 vessels in 1991.[22] Effort is concentrated in the central-western Pacific near Papua New Guinea, Micronesia, and Indonesia, with a limited catch in the Indian Ocean.

With the concentration of distant-water purse seine effort in the central western Pacific, many Pacific Island nations have become concerned about possible overfishing. In October 1992, eight members of the Forum Fisheries Agency known as the "Nauru Group" (Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tuvalu) signed an agreement which places a limit on the number of distant-water purse seine vessels fishing in the central and western Pacific. The vessels in this fishery mainly target skipjack and yellowfin tuna and account for most of the catch in the South Pacific region. The signatories justified the need for a limit by noting the rapid capitalization of this fishery and its possible detrimental effects on tuna stocks.[23]

To increase its access to the Pacific distant-water tuna fishery, Taiwan has informally discussed the possibility of entering into a multilateral-type arrangement for its regional fleet with the South Pacific Forum Fisheries Agency (FFA). The FFA was established in 1979 to assist member countries develop and manage their fisheries resources in a coherent and coordinated way. Taiwan officials are seeking an arrangement that would cover all gear types, but the FFA prefers an agreement confined to purse seiners.[24]

Labor Problems: As is the case with its ROK and Japanese competitors, Taiwan tuna fleets face an acute shortage of domestic labor. Although official statistics indicate the number of distantwater fishery workers has been fluctuating since 1986 (appendix I), it is reasonable to assume that a downward trend similar to that in Japan should take hold. Taiwan officials have announced plans to allow 50 percent of the crew on Taiwan distant-water tuna vessels to be comprised of foreign workers (foreign crews were limited to 33 percent in the past). Taiwan tuna vessels have employed crews from China, the Philippines, Indonesia, and Vietnam, but the need for foreign crew members has increased as fewer Taiwan citizens choose to work on fishing vessels.[25] Despite these efforts, though, it is expected that developing Asian countries such as China and Indonesia will become important players, particularly in distant-water tuna fisheries, thanks largely to their comparatively cheap and abundant labor.[26]

II. Promotion of Shipbuilding

Taiwan no longer officially promotes building fishery vessels and is, in fact, actively discouraging investment in this sector. Taiwan officials invested $221 million in building and upgrading fishing vessels in 1990, but spent only $69 million for this purpose in 1991. Since 1991, Taiwan has instituted a freeze on applications for new offshore fishing vessels and imposed a zero-growth policy on the distant-water fleet; i.e. only when an old vessel is retired will a new vessel be approved. Taiwan officials have also forbidden the purchase of foreign fishing vessels.[27]

III. Current Status of Shipbuilding

The number of Taiwan shipyards building and repairing fishing vessels has decreased dramatically, from 842 in 1989 to just 228 in 1992 (appendix J). Accordingly, the cumulative capacity of fishing vessels has also dropped by over six times during those three years. It is evident that Taiwan official policies which discourage new investment in the fisheries sector are having a profound effect on the Taiwan fish building industry. As in Japan and the ROK, Taiwan shipbuilders are constructing cargo and passenger vessels instead of fishing vessels.

Taiwan officials are, however, constructing fishery enforcement vessels to strengthen their ability to regulate their fishing fleets. Taiwan planned to deploy 3 long-range and 2 coastal patrol vessels by October 1992. The vessels were scheduled to be constructed in Taiwan shipyards at an estimated cost of $23 million. The Taiwan Council of Agriculture will oversee this project which is primarily designed to enhance Taiwan's ability to enforce international fishery agreements, including the large-scale pelagic driftnet moratorium proclaimed by the United Nations. The annual cost of operating the 5 vessels is estimated at $4.6 million.[28]

IV. Regulation of Fleet Size

Taiwan official measures described in the previous sections on driftnet fishing and promotion of shipbuilding provide the best examples of official regulation of fleet size. It should be noted, however, that the buy-back scheme mentioned in relation to driftnet vessels is, in fact, open to all fishing vessels, with driftnet vessels given first priority.

V. Vessel Exports

According to official statistics, Taiwan exported no fishing vessels between 1985-89 and during 1992. In 1990, two vessels were exported to Honduras with a total capacity of 403GRT and worth $3.2 million, three vessels were exported to Indonesia with a total capacity of 120GRT and worth $1.5 million, and one vessel was exported to Pakistan having 85GRT and worth $200,000.

Trade statistics for 1991 show that one vessel, having 330GRT and worth $4.7 million was exported to Mauritius, and one vessel of 306GRT and worth $800,000 was exported to Panama. The low trade value figure for the second vessel suggests that, unlike in Japan, Taiwan vessels are either being scrapped, kept in port, or used for other purposes.[29]

Although not being exported, many Taiwan fishing vessels, especially tuna longliners, are apparently being registered with foreign "flag-of-convenience" nations. One of the leading flag-of-convenience states is Honduras, where at least 70 Taiwan-owned 700-1,000GRT class tuna longliners are registered (appendix K).

VI. Access to Foreign Fishing Grounds

Distant-water fishing operations by the Taiwan fleet have been restricted in recent years by the imposition of 200-mile EEZs. Since future Taiwan distant-water fishing can only continue under cooperative arrangements, Taiwan has negotiated a number of fishery agreements, either directly or through private fishing organizations. Taiwan had fishery agreements or arrangements with 22 countries or areas as of the end of 1992. A total of 801 Taiwan distant-water vessels fished under these cooperative arrangements with a total 1992 catch estimated at 200,000 tons.[30]

The most common type of agreement generally requires payment of fishing fees, or establishment of joint venture operations in exchange for access to fishing grounds. Taiwan officials conduct negotiations directly with the few countries with which it has official relations. Taiwan officials have concluded formal fishery agreements with the following nations: South Africa, the Marshall Islands, the Solomon Islands, Tonga, and Tuvalu.

Taiwan's other bilateral agreements/ arrangements have been established through private organizations, such as the Overseas Fisheries Development Council, the Taiwan Fishermen's Association, the Taiwan Deep-Sea Tuna Boat Owners Association, and private fishery

companies. Taiwan currently has private-level agreements with the following countries: Palau, Papua New Guinea, Fiji, Vanuatu, the Philippines, Indonesia, India, Western Samoa, Pakistan, Sierra Leone, the Falkland Islands, the Cook Islands, Micronesia, Kiribati, Russia, Vietnam, and Brazil. The agreements with Kiribati, Vietnam, and Brazil are new, while the agreement with Micronesia is a renewal after the previous agreement lapsed. Agreements with Oman and Liberia were recently terminated because of poor catches, and Australia terminated its agreement with Taiwan because of depleted domestic fishery resources. Detailed information is available on the following countries:

A. Former Soviet Union/Russian Federation

The Overseas Fisheries Development Council signed a memorandum of understanding with the former Soviet Sovrybflot organization in August 1991 which allowed Taiwan vessels to fish in the waters off Sakhalin Island and the Kamchatka Peninsula. The catch in the former Soviet zone was not very profitable, however, so the venture was not renewed when it expired on November 15, 1992. There are no indications that Taiwan will seek future access to the Russian EEZ.[31]

B. East Asia

China: China and Taiwan have established a squid fishing and processing joint venture. The Dalian Jinbin Company, Ltd., will be operated jointly by the Dalian Ocean Fishing Company of China and an unidentified Taiwan company. Total investment in the venture is estimated at $7 million.[32]

C. South/Southeast Asia

Indonesia: Taiwan trawlers fish in Indonesian waters under a private fisheries agreement which allows Taiwan vessels access under joint venture operations or by leasing arrangements with Indonesian companies. Few other details are available concerning this agreement, but as many as to 50 pairs of Taiwan trawlers are reportedly fishing in the Indonesian EEZ.[33]

Pakistan: Taiwan tuna vessels have engaged in an extensive fishery in the Pakistani EEZ since 1991. A total of 50 Taiwan vessels are reportedly fishing there. Each vessel pays a fee of $18,518, to which is added 3 percent of the Free on Board (FOB) value of fishery products exported, or approximately $16,000 per shipment. The target species are yellowfin tuna, skipjack, billfish, and sharks; 98 percent of the catch is exported to Japan. Catch statistics are not available, but fishing has reportedly been quite good in this ground. The Taiwan industry expects Pakistan to request much higher access fees when negotiating the renewal of the current contract which expired in August 1993.[34]

Philippines: Taiwan was reportedly seeking to establish a joint fishing venture based on a memorandum on fishery cooperation signed in 1991. The Philippines suggested an arrangement whereby the joint venture company would lease Taiwan vessels and fish with them in the Philippine EEZ.[35]

Vietnam: Taiwan and Vietnam have established a joint fisheries company called SHANGNAM. This company is one result of the Taiwan's official efforts to encourage greater Taiwan private investment in Vietnam and divert some Taiwan business from China. Taiwan officials fear the Taiwan and Chinese economies are becoming too interdependent, a dangerous situation if Beijing were suddenly to shift its economic policies. Taipei is also concerned that economic interdependence may give Beijing increased political leverage. Taiwan private investment in Vietnam up to now, however, has been constrained by uncertainties about Vietnam's legal system and its high operational costs compared to those found in China.[36]

D. Oceania

Australia: An agreement with Australia provided access to Australian waters for approximately 50 Taiwan pair-trawlers during the 1980s.[37] This agreement has reportedly been terminated.

Fiji: Fiji licenses Taiwan longliners on an individual basis, provided these vessels land their catch in Fiji and sell it to a Fiji company. A total of 21 Taiwan longliners were leased to the Pacific Fishing Company during 1990.[38]

Kiribati: Taiwan has an agreement with Kiribati which permitted 20 Taiwan longliners access to Kiribati waters for a fee of $250,000 in 1990.[39]

Micronesia: Taiwan concluded its first fisheries access agreement with Micronesia in 1979. This private agreement granted access to 30 small Taiwan longliners which paid access fees in a lump-sum payment. The access agreement expired in 1990 and was not renewed for unknown reasons. Through a special arrangement between a foreign company and the Micronesian State of Pohnpei, 9 Taiwan longliners based in Pohnpei were licensed in 1991.[40] The State of Chuuk allows Taiwan tuna vessels to fish in Chuuk coastal waters and in Weno Harbor. Chuuk collects fees and hopes to accommodate larger operations when new shore facilities are built.[41]

The Ting Hong Oceanic Enterprise Company, Limited, reportedly operates 104 China-flag and Taiwan-flag tuna vessels out of Yap, Micronesia, and plans to increase this number to 150 units by the end of 1993, and 200 vessels by the end of 1994. Local Micronesian officials, however, have indicated such a large increase would depend on the ability of Yap's infrastructure to keep pace.[42]

Palau: Taiwan vessels are fishing in Palau waters through two joint venture companies. Most operate via the Palau Marine Industries Corporation (PMIC), a private venture with Chinese/Taiwan ownership in partnership with Palauans. A total of 75 longliners (64 from Taiwan) are registered through the PMIC which pays an annual lump-sum access fee of $126,000. The other joint venture company, Palau International Traders Inc. (PITI) is a private venture with Japanese and Micronesian ownership in partnership with Palauans. A total of 54 longliners, 4 of which are from Taiwan, are registered with PITI which pays an annual lump-sum access fee of $130,500.[43]

Papua New Guinea: Taiwan was reportedly on the verge of signing a private fisheries agreement with Papua New Guinea (PNG) in 1992. The agreement would allow an unspecified number of Taiwan vessels access to PNG waters in exchange for a six percent tax on the cost, insurance and freight (CIF) value of fish caught in PNG waters. Taiwan has also agreed to provide $2.2 million in assistance to the Kavieng Fisheries College.[44]

Vanuatu: The Kaohsiung Fisherman's Association signed a fisheries cooperation agreement with Vanuatu in 1989. Taiwan longliners are each required to pay a $5,000 license fee for access to Vanuatu waters. There were 36 Taiwan longliners licensed in Vanuatu waters in 1990, with 23 licensed in 1991 and 19 licensed in 1992.[45] It is unclear why the number of vessels has decreased.

E. Africa/Middle East

Oman: A small number of Taiwan longliners fish in Oman. Taiwan-registered longliners began fishing in Omani waters in 1989. As many as 19 Taiwan longliners fished there in 1989-90, but that number decreased to 8 in 1990-91 and 11 in 1991-92. The longliners target yellowfin tuna, but also catch billfish and shark.[46] One possible reason for the reduction of effort in Oman was the pressure from the Japanese tuna industry which felt that Taiwan was dumping low-quality Oman-origin yellowfin tuna on the Japanese market.[47]

Seychelles: A limited number of Taiwan tuna longliners has been licensed to fish in Seychelles waters. The most recent data available indicates that 16 Taiwan longliners were registered there in 1990.[48]

South Africa: Taiwan and South Africa initially concluded a fisheries agreement in 1978 under which the Taiwan tuna and trawler fleets received catch allocations in South African waters. Taiwan distant-water trawlers received allocations for hake (1,350 t) and horse mackerel (3,500 t) in 1990. It is not known how many vessels were authorized to fish.[49] With foreign allocations in South African waters being phased out in 1993, Taiwan vessels will no longer have direct access to this fishery.

F. Latin America

Argentina: Argentina announced in early 1993 that it would allow 13 Taiwan jiggers access to its EEZ for a licensing fee of $260,000 per vessel. The arrangement ended 7 years of negotiations between Taiwan and Argentina over illegal Taiwan jigging in Argentine waters.[50]

Central America: Taiwan has provided considerable fisheries technical assistance to developing countries in Central America. Most of this assistance is related to the Taiwan official policy of encouraging domestic shrimp farming operations to relocate overseas to avoid high production costs and environmental degradation.[51] Four fishery missions

have been dispatched to Panama, Costa Rica, Honduras, and the Dominican Republic in 1993.[52]

Falkland Islands: During the years 1987-1990, between 13 and 30 Taiwan jiggers were licensed to fish in Falkland Islands waters. Since 1990, the number of Taiwan jiggers has increased rapidly to 39 vessels in 1991, 51 vessels in 1992, and 71 vessels in 1993.[53] This increase in vessel deployment is primarily the result of a recently signed fisheries cooperation agreement with the United Kingdom which grants Taiwan's squid jiggers greater access to the Falkland Islands' 150-mile EEZ.[54]

VII. Outlook

The distant-water fisheries are the most profitable sector of Taiwan's fisheries. The advent of 200-mile EEZs, the driftnet moratorium, depleted high-seas fishery resources, and a zero-growth official policy for the distant-water fleet, however, mean that the prospects for expansion in this sector are limited. Fewer Taiwan residents are interested in commercial fishing, preferring more lucrative on-shore activities. Although Taiwan officials will invest $717 million in the fisheries industry under the current Six-Year Plan (1990-96), the bulk of the funds will be spent on improved fisheries management, cooperation with international fishery organizations, implementation of fisheries conservation measures, and harbor construction.

A. Trawlers

Taiwan's distant-water trawler fleet owners have reported decreasing catch in 1990 and 1991, and there is no evidence to suggest that this trend will change. Access to coastal fisheries is limited primarily to India and Indonesia, and most of the catch is sold on the domestic Taiwan market. For the foreseeable future, no significant change in areas of deployment are expected. As the trawler fleet ages and old vessels are retired or scrapped, they will not be replaced. The catch should continue to decrease as the fleet is being reduced.

B. Squid Jiggers

Taiwan's squid jigging fleet will probably continue to grow in the short-term as former driftnet vessels convert to this method. In the long-term, however, growth in this fleet will be constrained by the economics of the squid market which can only absorb limited additional supplies. The Taiwan fleet will probably follow in the footsteps of its Japanese and ROK competitors and increase its effort in coastal areas of Argentina and Peru. Unlike its Japanese and ROK competitors, however, the Taiwan jigging fleet will probably continue to increase effort off the Falkland Islands where the recent bilateral agreement permits access to more Taiwan jiggers. There is no evidence that Taiwan vessels are engaged in squid jigging off Ecuador or Brazil, but if ROK and Japanese vessels are successful in these new grounds, Taiwan jiggers will probably follow.

C. Driftnet Vessels

Older Taiwan driftnet vessels have been purchased by Taiwan officials under its buy-back program; they are now used as artificial reefs. Newer driftnet vessels will probably be converted for fishing in two distant-water fisheries: 1) squid jigging in the southwest Atlantic and off Peru, and 2) tuna longlining in the Indian Ocean.

D. Distant-water Tuna Vessels

Longliners: The Taiwan distant-water tuna longliner fleet in the Atlantic and Pacific Oceans has probably reached its limit, in terms of being able to profitably catch tuna for the Japanese sashimi market. Effort in the Indian Ocean longliner fishery will probably increase slightly, however, as former driftnet vessels operating on this ground convert to the longlining method. In the Pacific Ocean, the most probable future scenario is a pan-Asian network where Taiwan companies provide financing and technical expertise for Chinese and Indonesian longliners which can catch sashimi-grade tuna in Pacific fisheries at a much lower cost than Taiwan vessels.

Purse Seiners: The Taiwan distant-water tuna purse seine fleet will probably continue to grow in the number of vessels. It will focus its effort on the central south Pacific fishery. This growth will be constrained, however, by increasingly stringent access

requirements imposed by adjacent island nations where most of the skipjack and yellowfin tuna resource, targeted by purse seiners, is located. If Taiwan is able to conclude an access agreement with the South Pacific Forum Fisheries Agency, it would provide a strong impetus for expansion in this region.

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Endnotes

1. Distant-water fishing vessels are defined as those having more than 100 gross registered tons.

2. *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau, 1991.

3. "Industrial Outlook Report: Fishing Industry 1991/1992," American Institute in Taiwan, p. 3.

4. Shieh, Dah wen, "The Impact of Global Exclusive Economic Zone on Taiwan's Distant-Water Fishing Industry," January 1988, p. 6.

5. Shieh, *op. cit.*, p. 7.

6. *The Kaohsiung Fisheries*, Kaohsiung Municipal Fisheries Department, pp. 6-7, 1992.

7. "Giant Longline Effort," *Fishing News International*, March 1993, p. 10. Lloyd's of London, however, reports that there was only 1 Taiwan trawler in 1990, and zero in 1991, with a capacity greater than 1,000 gross registered tons (appendix A).

8. Shieh, *op. cit.*, pp. 4 and 7.

9. Much of the information on the Taiwan jigging fleet comes from: *Cephalopods: ADB/Infofish Global Industry Update*, Asian Development Bank/Infofish, 1991, p. 62.

10. The Council of Agriculture reports 64 Taiwan distant-water driftnet vessels participated in the 1992 driftnet fishery. It should be noted that the data for driftnet vessels in appendix B shows only those vessels greater than 100GRT, and is thus an incomplete total.

11. "Gone Fishing," *Far Eastern Economic Review*, 25 February 1993, p. 24.

12. *Katsuo-Maguro Tsushin*, No. 6381, September 26, 1991, as printed in *Forum Fisheries Agency News Digest*, No. 6, November-December 1991.

13. For example, see Julian Baum, "Nets Across the Strait," *Far Eastern Economic Review*, 8 July 1993, p. 22.

14. Shieh, *op. cit.*, p. 2.

15. *Katsuo-Maguro Tsushin*, No. 6591, August 6, 1992, as printed in *Forum Fisheries Agency News Digest*, No. 5, September-October 1992, p. 6.

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19."Taiwan Phases Out Drift-Netting," *op. cit.*, pp. 24-25.

20. South Pacific Commission, *Regional Tuna Bulletin-Fourth Quarter 1992*, Noumea, New Caledonia, 1993, p. 4.

21. Shieh, *op. cit*, p. 3.

22. The Forum Fisheries Agency states there are 46 Taiwan purse seiners active in the central western Pacific, while the latest official Taiwan statistics put the number at 45.

23. *Forum Fisheries Agency News Digest*, No. 6, November-December 1992, page 1.

24. Forum Fisheries Agency, *op. cit.*, p. 10.

25. *Nikkan Suisan Keizai Shinbun*, March 31, 1993.

26. *Nikkan Suisan Keizai Shinbun*, July 27, 1993.

27. American Institute in Taiwan, June 7, 1993, p. 7.

28. *The Free China Journal*, February 21, 1992.

29. Trade data was supplied by the American Institute in Taiwan.

30. American Institute in Taiwan, June 7, 1993.

31. American Institute in Taiwan, *op. cit.*

32. Xinhua News Service, February 22, 1992.

33. *The Kaohsiung Fisheries*, *op. cit.*, p. 7.

34. U.S. Consulate, Karachi, June 28, 1993; and *Nikkan Suisan Keizai Shinbun.*, July 27, 1993.

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37. Shieh, *op. cit.*, p. 9.

38. Ministry of Primary Industries, Fiji Fisheries Division, *Annual Report 1990.*

39. *BBC Summary of Weekly Broadcasts Part 3-The Far East*, 25 April 1990.

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48. Seychelles Fishing Authority, *Tuna Bulletin-Second Quarter 1991*, p. 14.

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50. *Free China Journal*, February 16, 1993.

51. *Free China Journal*, March 26, 1993.

52. American Institute in Taiwan, June 21, 1993.

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54."Sino-British Squid Pact," *The Free China Journal*, October 4, 1991, p. 3.

Appendices

Appendix A.-- Taiwan. Number of fishing vessels, ranked by gross registered tonnage; 1975-92.

Year	Gross Registered Tons (GRT)			Total
	500-999	1,000-1,999	Over 2,000	
	Number of vessels			
1975	6	3	-	9
1976	7	3	-	10
1977	6	2	-	8
1978	7	2	-	9
1979	8	3	-	11
1980	8	3	-	11
1981	11	3	-	14
1982	12	3	-	15
1983	13	2	-	15
1984	13	2	-	15
1985	15	2	-	17
1986	15	2	-	17
1987	14	1	-	15
1988	14	1	-	15
1989	13	1	-	14
1990	16	1	-	17
1991	17	-	-	17
1992	17	3	-	20

Source: *Lloyd's Register of Shipping Statistical Tables,* London, UK, various years.

Appendix B.-- Taiwan. Fishing vessels having over 100GRT, by number and gross registered tonnage; 1985-91.

Vessel Type	1985		1986		1987		1988		1989		1990		1991	
	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT	No	GRT
	Number of Vessels/Tonnage (thousands)													
Tuna Longliners	542	179	610	200	653	235	698	274	779	368	841	372	759	335
Otter Trawlers	356	73	375	74	440	84	479	86	522	99	536	104	491	96
Bull Trawlers	270	62	198	59	192	58	191	57	184	57	183	57	172	54
Squid Jiggers	16	6	19	9	37	21	62	47	74	56	77	58	99	78
Driftnet	3	0.5	2	0.5	2	0.5	3	1	12	4	14	4	14	3
Tuna Purse Seine*	-	-	-	-	-	-	-	-	19	18	35	31	46	45
Mackerel Purse Seine*	-	-	-	-	-	-	-	-	25	8	32	9	33	8
Other	97	36	106	42	108	59	135	68	-	-	-	-	-	-
Total	1,284	357	1,310	385	1,432	458	1,568	533	1,709	610	1,786	635	1,613	619

Source: Taiwan Fisheries Bureau

* - Tuna and mackerel seiners were not distinguished until 1989.

Appendix C. --Taiwan. Number of fishing vessels having more than 100GRT, by selected gross tonnage capacity; 1985-92..

Vessel Type	1985	1986	1987	1988	1989	1990	1991	1992
	Number of vessels							
100-200GRT	500	470	522	546	557	560	517	530
200-500GRT	718	747	756	788	813	825	757	676
500-1,000GRT	56	81	138	219	317	375	373	374
1,000-2,500GRT	10	12	16	15	22	26	36	41
Over 2,500GRT	-	-	-	-	-	-	-	--
Total	1,284	1,310	1,432	1,568	1,709	1,786	1,683	1,621

Source: Taiwan Fisheries Bureau.

Appendix D. --Taiwan. Fisheries catch, by type of fishery; 1980, 1985-91.

Type of Fishery	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Marine Fisheries								
Distant-water	370,342	441,747	497,403	596,969	731,700	734,459	766,985	714,263
Coastal	350,987	288,363	272,152	277,613	275,680	333,798	292,391	266,945
Off-shore	37,296	54,467	56,737	53,905	49,089	49,794	48,362	41,231
Mariculture	29,988	36,067	28,266	29,520	34,617	37,074	36,507	31,192
Sub-total	788,613	820,644	854,558	958,007	1,091,086	1,155,125	1,144,245	1,053,631
Freshwater Fisheries								
Wild catch	2,701	2,409	2,183	2,255	3,424	3,877	3,494	2,327
Freshwater culture	145,020	214,668	237,846	275,908	266,357	212,681	307,756	260,693
Sub-total	147,721	217,077	240,029	278,163	269,781	216,558	311,250	263,020
Grand Total	936,334	1,037,721	1,094,587	1,236,170	1,360,868	1,371,681	1,455,495	1,316,651

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau.

Appendix E. --Taiwan. Distant-water fisheries catch, by vessel type; 1980, 1985-91.

Vessel Type	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Tuna								
Longliners	83,669	119,232	151,233	146,414	147,615	139,113	155,921	134,574
Purse Seine	19,918	50,380	52,011	55,683	114,617	117,164	124,599	107,062
Total Tuna	103,587	169,612	203,244	202,097	262,232	256,277	280,520	241,636
Squid Jigging	-	48,966	50,945	115,249	129,177	117,717	88,254	124,176
Driftnet	-	55,512	46,282	67,930	62,146	118,131	163,146	142,308
Trawlers								
Otter Trawl	73,826	90,509	91,780	93,896	133,160	116,675	97,145	86,115
Bull Trawl	18,984	72,141	87,750	108,575	126,842	111,480	104,128	98,775
Total Trawler	92,810	162,650	179,530	202,471	260,002	228,155	201,273	184,890
Others	941	5,006	17,852	9,222	18,143	14,089	33,792	21,253
Total	197,339	441,747	497,403	596,969	731,700	734,459	766,985	714,263

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau.

Appendix F.-- Taiwan. Distant-water fisheries catch; by method of fishing and fishing grounds; 1980, 1985-91.

Method/Ground	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Otter Trawl								
Bering Sea	na	na	na	na	na	-	6	-
Atlantic Ocean	na	na	na	na	na	-	-	599
Australia	na	na	na	na	na	-	-	-
Other	na	na	na	na	na	116,675	97,139	85,516
Total	73,826	90,509	91,780	93,896	133,160	116,675	97,145	86,115
Bull Trawl								
Sunda Shelf	na	na	na	na	na	-	-	-
Australia	na	na	na	na	na	-	-	-
Indian Ocean	na	na	na	na	na	-	52	-
Other	na	na	na	na	na	111,480	104,076	98,775
Total	18,984	72,141	87,750	108,575	126,842	111,480	104,128	98,775
Tuna Purse Seine								
Pacific Ocean	na	na	na	na	na	103,587	109,033	95,687
Indian Ocean	na	na	na	na	na	13,577	15,566	11,376
Total	19,918	50,380	52,011	55,683	114,617	117,164	124,599	107,062
Tuna Longliners								
Pacific Ocean	na	na	na	na	na	17,496	25,256	37,918
Atlantic Ocean	na	na	na	na	na	28,465	31,022	22,738
Indian Ocean	na	na	na	na	na	70,717	28,851	21,582
Other	na	na	na	na	na	22,435	70,792	52,336
Total	83,669	119,232	151,233	146,414	147,615	139,113	155,921	134,574
Driftnets								
North Pacific	na	na	na	na	na	12,417	11,541	-
South Pacific	na	na	na	na	na	1,035	1,683	-
Indian Ocean	na	na	na	na	na	45,311	25,252	6,334
Other	na	na	na	na	na	16,565	86,637	84,648
Total	-	55,512	46,282	67,930	62,146	75,328	125,112	90,982

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau, 1985-91.

Appendix F (continued).-- Taiwan. Distant-water fisheries catch; by method of fishing and fishing grounds; 1980, 1985-91.

Method/Ground	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Squid Jigging								
North Pacific	na	na	na	na	na	759	-	-
SW Pacific	na	na	na	na	na	24,400	-	-
SW Atlantic	na	na	na	na	na	36,717	7,314	11,295
Other	na	na	na	na	na	55,842	80,940	112,881
Total	-	48,966	50,495	115,249	129,177	117,717	88,254	124,176
Squid Driftnet								
North Pacific	na	na	na	na	na	26,243	36,837	40,063
Other	na	na	na	na	na	16,650	1,197	11,264
Total	-	-	-	-	-	42,893	38,034	51,326
Saury Torch Light								
NW Pacific	na	na	na	na	na	4,682	27,270	11,742
Other	na	na	na	na	na	7,354	4,607	7,731
Total	-	-	-	-	-	12,036	31,877	19,473
Other	941	5,006	17,852	9,222	18,143	2,053	1,915	1,780
Grand Total	197,339	441,747	497,403	596,969	731,700	734,459	766,985	714,263

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau, 1980-91.

Appendix G.-- Taiwan. Distant-water fisheries catch; by method of fishing and species; 1980, 1985-91.

Method/Ground	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Otter Trawl								
Threadfin bream	985	1,792	1,951	1,868	3,471	1,246	2,564	1,019
Snapper	-	2,934	1,916	2,009	2,411	3,962	3,905	2,712
Hairtail	6,727	4,668	5,743	4,652	10,766	11,718	6,290	4,048
Sharks	1,267	975	3,030	4,145	4,818	6,910	9,718	7,974
Cuttlefish	3,369	3,890	4,184	3,474	6,376	6,392	5,067	7,421
Squid	726	8,532	5,493	8,492	17,348	16,692	21,040	29,289
Shrimp	10,539	19,299	20,687	17,160	18,729	14,032	9,892	6,857
Other	50,214	50,211	48,776	52,096	69,241	55,723	38,669	26,795
Total	73,827	90,509	91,780	93,896	133,160	116,675	97,145	86,115
Bull Trawl								
Threadfin Bream	308	3,779	4,488	4,278	5,610	1,861	4,209	1,573
Snapper	-	6,525	4,929	5,166	4,105	6,747	6,648	4,618
Hairtail	1,940	2,809	6,480	4,667	7,075	8,767	2,331	1,777
Sharks	256	1,229	4,364	6,089	7,251	10,638	16,051	13,597
Cuttlefish	899	4,077	4,965	4,444	8,510	7,156	5,446	10,666
Squid	207	15,383	13,203	20,658	27,874	19,185	27,868	39,680
Other	15,374	38,339	49,321	63,273	66,417	57,126	41,523	26,864
Total	18,984	72,141	87,750	108,575	126,842	111,480	104,076	98,775
Tuna Purse Seine								
Skipjack	-	3,433	7,876	15,928	26,798	42,376	76,054	59,436
Albacore	-	2,467	749	1,403	8,038	15,563	-	-
Bigeye	-	497	398	113	452	353	319	695
Yellowfin	-	1,357	2,718	4,599	6,782	11,099	14,540	17,356
Bluefin	-	80	16	21	197	264	149	-
Billfish	-	1,530	237	853	2,502	3,465	3,994	3,174
Horse Mackerel*	16,088	11,479	10,478	6,064	16,376	na	na	na
Mackerel*	3,830	18,712	27,155	21,720	27,712	na	na	na
Other	-	10,825	2,384	4,982	25,780	44,044	29,543	26,401
Total	19,918	50,380	52,011	55,683	114,617	117,164	124,599	107,062

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau, 1980-91.

Appendix G (continued).-- Taiwan. Distant-water fisheries catch; by method of fishing and species; 1980, 1985-91.

Method/Ground	1980	1985	1986	1987	1988	1989	1990	1991
				Metric tons				
Tuna Longline								
Skipjack	233	1,057	3,648	164	1,033	5,022	5,617	4,006
Mackerel	-	3,685	1,849	1,027	-	1,594	307	4,605
Albacore	55,852	61,482	88,014	77,015	73,430	76,254	59,531	46,757
Bigeye	11,444	12,317	15,523	16,642	15,897	12,056	12,712	15,378
Yellowfin	8,691	8,317	12,737	17,699	17,927	11,159	18,938	13,619
Bluefin	65	142	364	528	507	698	595	604
Billfish	4,922	6,253	10,195	10,046	10,168	10,003	15,911	14,013
Shark	1,033	20,311	11,217	11,685	14,322	14,649	26,117	24,933
Other	1,429	5,668	7,686	11,608	14,331	7,678	16,193	10,659
Total	83,669	119,232	151,233	146,414	147,615	139,113	155,921	134,574
Driftnets								
Skipjack	-	766	670	2,680	705	3,629	4,311	2,834
Mackerel	-	2,267	2,378	4,105	-	6,485	14,019	18,421
Albacore	-	2,466	5,150	3,326	16,520	43,534	65,741	36,315
Bigeye	-	420	195	214	395	391	540	352
Yellowfin	-	285	193	791	618	874	1,003	865
Bluefin	-	67	81	87	234	319	305	107
Billfish	-	1,886	1,004	1,349	2,869	4,283	4,920	3,836
Sharks	-	16,698	14,669	18,067	6,447	9,688	15,064	14,009
Other	-	9,876	2,157	1,543	34,358	6,125	19,209	14,243
Total	-	34,731	26,497	32,162	62,146	75,328	125,112	90,982
Squid Jigging								
Squid	-	47,973	50,400	115,249	129,177	117,717	88,254	123,787
Other	-	1,023	95	-	-	-	-	389
Total	-	48,966	50,495	115,249	129,177	117,717	88,254	124,176
Squid Driftnet								
Squid	-	20,781	19,785	35,768	22,228	42,252	36,776	51,133
Other	-	-	-	-	-	641	1,258	193
Total	-	20,781	19,785	35,768	22,228	42,893	38,034	51,326
Saury Torch Light								
Saury	-	-	-	-	-	12,036	31,877	19,473
Other	941	5,006	17,852	9,222	18,143	2,053	1,915	1,780
Grand Total	197,339	441,747	497,403	596,969	731,700	734,459	766,985	714,263

Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau, 1980-91.

Appendix H.- Taiwan. Distant-water tuna longliners fishing fleet; by fishing grounds and gross registered tonnage; 1980-90 .

Year	Atlantic Ocean			Indian Ocean		
	50-200GRT	200-500GRT	Over 500GRT	50-200GRT	200-500GRT	Over 500GRT
1980	21	146	1	39	72	1
1981	29	161	-	39	70	-
1982	40	173	-	52	75	-
1983	13	86	-	61	138	-
1984	12	104	-	37	113	-
1985	21	155	4	26	100	1
1986	17	168	5	27	120	6
1987	9	127	4	21	128	19
1988	9	98	4	19	129	39
1989	9	88	17	17	146	100
1990	8	91	50	19	140	117

Sources: Atlantic-ICCAT Statistical Bulletin, 1990: Indian-Indo-Pacific Tuna Development and Management Programme Data Summary No. 12, May 1992.

Appendix I. -- Taiwan. Number of fishery workers; 1980, 1985-91.

Type of Worker	1980	1985	1986	1987	1988	1989	1990	1991
Number of workers								
Distant-water fishery workers								
Full-time	27,759	98,458	36,952	37,668	38,794	41,490	36,470	36,692
Part-time	4,883	1,276	896	1,847	2,550	1,365	1,279	1,477
Total	32,642	99,734	37,848	39,515	41,344	43,055	37,749	38,169

Note: It is unclear why the number of workers was so high in 1985.
Source: *Fisheries Yearbook-Taiwan Area*, Taiwan Fisheries Bureau-1980, 1985-91.

Appendix J. -- Taiwan. Fishing vessels built at Taiwan shipyards; by number of vessels and gross registered tonnage; 1985-92.

Year	Number of Vessels	GRT
1985	517	46,308
1986	564	51,258
1987	669	85,143
1988	720	105,411
1989	842	112,881
1990	295	72,218
1991	224	25,012
1992	228	16,695

Source: American Institute in Taiwan, June 7, 1993.

Appendix K.--Honduras. Foreign fishing vessels* registered in Honduras, July 1993.

Vessel Name	Vessel Name	Vessel Size GRT	Owner
Belgium			
	Chien Hang No. 6	711.00	Lubmain International S.A.
	Fu Yuan No. 16	711.00	Lubmain International S.A.
	Fu Yuan No. 6	708.00	Lubmain International S.A.
	Hsin Huang No. 201	706.57	Lubmain International S.A.
	Tching Ye No. 217	725.00	Lubmain International S.A.
	Tching Ye No. 236	726.00	Lubmain International S.A.
	Yu I Hsiang No. 617	708.00	Lubmain International S.A.
Honduras			
	Oriente No. 7	658.40	El Oriente S. De R.L.
Mauritius			
	Hsin Hua No. 1	708.00	Hsin Hua Fishery Co.
Panama			
	Focus	999.70	Focus Trading S.A.
	Focus No. 101	912.53	Focus Trading S.A.
	Polestar	889.17	Oasis Venture Corporation
Singapore			
	En Chun No. 2	746.00	Swillington Limited.
	En Chun No. 6	746.00	Swillington Limited
	En Chun No. 7	746.00	Swillington Limited.
	Great Splendor	1,949.00	Korvin Fisheries Co.
	Hui Shun No. 6	719.00	Hui Jem Oceanic Enterprises Co.
	Sarn Fa No. 37	801.00	Sarn Fa Ocean Fishery
	Shang Weng	810.00	Shang Weng Ocean Fishery
Spain			
	Sekishu	991.37	Interburgo S.A.
Taiwan			
	Chang Hann No. 117	705.48	Chang Man Fishery Co. Ltd.
	Chen Chia No. 1	710.52	Cheng Chia Fishery Co.
	Chiao Chun No. 1	721.00	Chiao Chun Fishery Co.
	Chieh Hsiang No. 302	709.00	Chieh Fong Fishery Co.
	Chieh Hisiang No. 303	718.00	Chieh Fong Fishery Co.
	Chien Yu No. 7	712.68	Chien Yu Fishery Co.
	Chin Ching No. 1	719.00	Chin Ching Fishery Co.
	Chin Hui	704.84	Chin Hui Marine Products
	Chin Lung Yun No. 27	751.82	Chyi Yun Fishery Co.
	Chung I No. 126	705.55	Chung YNG Fishery Co.
	Fung Yue No. 102**	709.00	East Man Fishery Co.
	Fung Yue No. 102**	709.00	Shin Chun Fishery Co.
	Fv Kuang Hui No. 212	602.00	Kuang Hui Fishery Co.
	Fv Yuh Yow No. 201	717.00	Yuh Yih Fishery Co. Ltd.
	F.V. Tong Yu No. 6	715.80	Tong Yu Fishery Co.
	Hai Fa No. 11	706.30	Hai Fa Fishery Co.
	Hai Fa No. 21	717.48	Hai Fu Fishery Co.
	Hai Fa No. 31	718.00	Hai Hao Fishery Co.
	Hai Fa No. 62	713.00	Hai Fu Fishery Co.
	Hien Chung No. 1	735.00	Chang Jung Fang Co.
	Hsieh An No. 16	726.00	Hsieh An Fishery Co.
	Hsin Cheng Hsiang No. 101	711.30	Hsin Cheng Hsiang Fishery
	Hsin Hung No. 101	705.10	Hsin Hung Fishery Co.
	Hsin I Hsiang No. 11	711.39	Hsin Ying Hsiang Fishery
	Hsin Yuan No. 202	719.56	Hsin Yuan Fishery Co.
	Hsing Lung No. 31	718.00	Hsin Lung Fishery Co.
	Hsing Yun No. 101	709.04	Hsing Yun Fishery Co.
	Hung Chia No. 3	712.00	Chia Fu Fishery Co. Ltd.
	Hung Fu I No. 212	716.00	Hung Fu I Fishery Co.
	Hung Heng No. 121	722.00	Hung Heng Fishery Co.
	Hung Hsing No. 11	991.00	Yng. Sheng Oceanic Enterp.
	Hung Hsing No. 212	722.00	Hung Hsing Fishery Co.
	Hung Hwa No. 202	725.00	Hung Tzu Fishery Co.
	Hung Ming No. 231	719.09	Hung Ming Fishery Co.
	Hung Yu No. 122	722.72	Hung Yiu Fishery Co.

Appendix K (continued).--Honduras. Foreign fishing vessels* registered in Honduras, July 1993.

Vessel Name	Vessel Name	Vessel Size GRT	Owner
Taiwan (continued)			
	Hwa Hsing No. 16	993.00	Yih Sheng Fisheru Y Co.
	Hwa Kun No. 232	722.72	Hwa Kun Fishery Co.
	Hwa Ren No. 16	998.00	Hwa Shin Chang Marine
	Hwa Ren No. 6	1,076.00	Hwa Ren Fishery Co.
	I Chun No. 3	717.00	Luxiriant Fishery Co.
	Kuo Hung No. 808	714.00	Kuo Hung Fishery Co.
	Pilgrim	1,447.60	Altea Fish S. De R.L.
	Tai Chin No. 12	718.00	Tai Chin Fishery Co.
	Tai Fan No. 1	708.00	Tai Fan Fishery Co.
	Tai Hsing No. 11	720.00	Hsing Tai Fishery Co.
	Tung I No. 801	711 00	Tung I Fishery Co.
	Win Yeong Tai No. 136	1,095.46	Yu Chih Hsie
	Yi Mao 306	1,513.00	Yi Yang Marine Products
	Ying Pi Hsiang No. 3	706.00	Fu Chun Marine Products
	Yu Chan No. 201	705.10	Yu Chan Fishery Co.
	Yu Feng No. 116	719.00	Yu Chan Fishery Co.
	Yu Feng No. 68	719.00	Hung Chang Fishery Co.
	Yu I Hsiang No. 132	708.12	Yu-Hung Fishery Co.
	Yu I Hsiang No. 227	708.12	Yu-Hung Fishery Co.
	Yuh Yow No. 101	706.00	Yu Yuan Fishery Co.
	Yuh Yow No. 102	719.00	Yu Chang Marine Products
	Yuh Yow No. 127	729.00	Yu Pao Fishery Co.
	Yung Hsu No. 101	717.00	Yung Hsu Fishery Co.
	Yung Ta No. 606	1,410.24	Zen Lee Fishery Co.
	Yih Far No. 63	991.00	Chia Fu Fishery Co.
	Yih Shuen No. 61	993.00	Ting Fond Oceanic Development
	Yuan Chun No. 1	785.00	Yuan Chun Marine Products.
Thailand			
	Ekawat Reefer 2	580.00	S. Overseas Marine Corp.
	La Paloma	4,358.38	Fortuna Unity Co. Ltd.
	Sirichai Independence	1,841.19	Sirichai Fisheries Co.
United Kingdom			
	Glory	2,676.71	Greenbury Trading Ltd.

* - Only vessels over 500GRT are included.
** - This vessel is listed twice on the Honduran registry under two different owners.
Source: Fuerzas Armadas de Honduras, Marina Mercante Nacional, unpublished list, July 14, 1993.